

ASSESSMENT OF INNOVATION IN KENYA'S PUBLIC SECTOR ORGANISATIONS

By

J. E. AGOLLA

21229120

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Promoter: Professor J.B. VAN LILL

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ABSTRACT

Innovation is known as the eventual application of new ideas. Of late, a number of indicators have been progressively developed to gauge the level of innovation activities of organisations. The Oslo Manual is an example. But little is known about public sector innovation nuances. Innovation is a critical tool for achieving multiple goals such as improved welfare, improved quality of life of citizens and addressing some of the global challenges that inflict severe catastrophes on many nations namely diseases, crimes, disasters, accidents, poverty, hunger, conflict, and inadequate food security amongst others. A number of studies have been carried out on the assessment of innovation in organisations, with the majority of such studies concentrating on the private sector with only a few on public sector innovation, which has led to a gap in the field.

Assessment of innovation in the public sector is very important to policy makers and the government, for example in Kenya where the public sector plays a key role in the delivery of critical services, and the creation of employment opportunities to the ever-growing population. Therefore, the assessment of innovation in the public sector presents an opportunity to both public policy makers and the government alike to measure the “success” or “non-performance” of public sector organisations. Apart from that, innovation assessment provides a broad set of indicators that can shed light on innovation activities in public sector organisations and show how these can help government meet its mandate.

The purpose of the present research was first to explore the extent to which public sector organisations are innovative; second, to explore specific organisational drivers and barriers to innovation in public sector organisations; third, to find out how innovation can be assessed in public sector organisations; fourth, to explore the extent to which government is promoting innovation in the public sector organisations; fifth, to examine the specific factors that can be used by the public sector organisations to overcome barriers to innovation and to develop an innovation model that is applicable to public sector organisations in Kenya.

The present research is based on a survey of three selected Kenyan public sector organisations (PSOs) that were purposively sampled. These PSOs were chosen due to their legislative mandate; that is to promote regional development, create employment, and eradicate poverty among the local population and the nation at large. In brief, these organisations presented an interesting avenue for the present study, since innovation is seen as both essential for economic growth and employment creation. The present study developed a survey instrument to collect empirical data from the participants drawn from the three PSOs. The instrument was first pre-tested using 50 public sector experts, whose opinions and views were later incorporated in the final instrument. The final instrument consisted 115 items, and was scaled on Likert 5 point scale ranging from 1 (strongly disagree) to 5 (strongly agree). On the other hand, the qualitative data were collected using 16 middle managers drawn from the participants' organisations. In order to achieve the objective of the qualitative data collection, a pre-determined questionnaire was designed to guide the Focus Group Discussions (FGD). Focus Group Discussions were conducted in two sessions with each session lasting 45 minutes. A voice recorder was utilised to record the discussions, and to allow the researcher to time the discussions with minimal disruptions.

Quantitative data were analysed using both Structural Equation Modelling (SEM) using Analysis of Moments Structure (AMOS) version 16 integrated with SPSS version 17, in order to obtain hypothesised relationships in the structural model. Regression analysis was performed in order to identify the specific factors that were considered important in innovation in the public sector. In addition, regression analysis was also used to confirm the results of the SEM. Last, the qualitative data obtained through FGDs with the managers were analysed along thematic lines in order to obtain the subtle issues that could not be captured through the questionnaire. In addition, the FGD results were very critical because it only involved the managers (key informants) whose opinions and views reinforced the quantitative results. These results from both the analyses were interpreted differently, and then jointly discussed to complement one another.

To add to the current knowledge of assessment of innovation, drivers, barriers, strategies to overcome barriers, and innovation outcomes / indicators in the public sector organisations; three new measurement tools

were developed from this research. The first is a scaled index of top leadership that takes account of key dimensions of drivers to innovation; the second is a scaled index of strategies to overcome barriers to innovation, which takes account of factors that can be used to overcome barriers to public sector innovation; the third is a scaled index of internal drivers that take into account factors such as organisational strategy, organisational culture, and suppliers. These three tools are important additions to the limited existing tools that are available to researchers seeking to understand and assess public sector innovation. Therefore, this study claims methodological contributions of these tools.

The results of the present research indicate top management, leadership, technology, government policy, political support, entrepreneurship, networking, collaboration, and partnership with universities as notable drivers of innovation in the public sector. On the other hand, barriers to innovation in the public sector were a lack of clear innovation policy, absence of employees' freedom of expression, budget constraint, political interference, top management, over-reliance on existing resources, and inadequate reward system, while strategies to overcome the barriers identified were organisational leadership, incentives to innovators, collaboration, networking, creation of departments to coordinate innovation, and mentoring innovators. The study also identified intellectual property, customer satisfaction, patent rights, and new products / new services as innovation indicators / outcomes. The present study developed a model that was tested and can be used by future researchers interested in understanding dynamics of innovation in the public sector. Furthermore, this study contributes to the theory and the body of knowledge of innovation in the public sector where little is known about innovation. The present study has implications for researchers, policy makers and practitioners interested in innovation in the public sector. For future researchers, the present study offers an empirically driven model of innovation in the public sector, which could further be replicated in other geographical settings to corroborate the results of this study. To the policy makers, the study offers policy issues that need to be taken into account in order to promote innovation in the public sector, and lastly for the practitioners, the study model presents the factors that public managers can apply in order to enhance innovation in Kenya's PSOs.

The present research provides a foundation to build on by other studies, specifically the assessment of innovation in the public sector organisations. The present study also suggests future research to validate the model and measurement tool that was developed.

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DEDICATION

I dedicate my thesis to my family with a special feeling of gratitude to my loving late parents, David Nyagonya Onywa and Elizabeth Osano Nyagonya, my Uncle, MZEE Zadock Aduwo Onywa who took the mantle from where my father left To my wife, Mamelang and our two little angels: Elizabeth Osano Noella Anyango and Eleanor Agnes Arianna Atieno, for their patience and support. I had to deny them the basics of life in order to accomplish this thesis.

I also dedicate this thesis to my late sister and brother-in-law, Mr and Mrs Joseph Obonyo Abong'o.

STATEMENT OF ORIGINALITY

I hereby certify that I am the sole author of this thesis and that no part of this thesis has been published or submitted for publication.

I do certify to the best of my knowledge that this thesis does not infringe upon anyone's copyright nor violate any proprietary rights and that any ideas, techniques, quotations, or any other material from the work of other people included in my thesis, published or otherwise, are fully acknowledged in accordance with the standard referencing practices.

I declare that this is a true copy of my thesis as approved and that it has not been submitted for a higher degree to any other University.

Joseph Evans Agolla,

Signature: _____. Date: 30-03-2015

MC Faculty of Commerce and Administration

North West University

Mafikeng Campus

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LIST OF ABBREVIATIONS

AfDB – Africa Development Bank

CDA – Coast Development Authority

ENSDA – Ewaso Ng’iro South Development Authority

ESNDA – Ewaso Ngi’ro North Development Authority

FDI – Foreign Direct Investments

GDP – Gross Domestic Product

GNP – Gross National Product

KNBS – Kenya National Bureau of Statistics

KVDA – Kerio Valley Development Authority

LBDA – Lake Basin Development Authority

MORDAs – Ministry of Regional Development Authorities

NESTA – National Endowment for Science Technology and the Arts

NSI – National Innovation Systems

OECD – Organisations for Economic Co-operation Development

PSOs - Public sector organisations

RDAs- Regional Development Authorities

R&D – Research and Development

S & T – Science and Technology

SEM- Structural Equation Model

STI – Science, Technology and Innovation

TARDA – Tana and Athi Rivers Development Authority

UK – United Kingdom

UN – United Nations

UNDP –United Nations Development Programme

USA – United States of America

WB – World Bank

WBI – World Bank Institute

WIPO – World Intellectual Property Organisation

CHAPTER 1 BACKGROUND TO THE STUDY

1.1 INTRODUCTION

Public sector innovation is now recognised as a vital factor in meeting the challenges of globalisation and demographic changes, and at the same time sustaining a high level of public services to citizens and businesses (Bloch, Bugge & Slipersaeter, 2010:1; Khilji, Mroczkowski, & Assudani, 2012:257; Lee, Olson & Trimi, 2012:829; Lee, Hwang & Choi, 2012). In a similar study of public sector, scholars (Nusair, Ababneh & Bae, 2012:182) echoed that public sector organisations face several challenges to be more responsive to the needs of citizens all over the world. To meet these challenges, firstly the public sector has to increase the efficiency in public services to cater for the increased demands from citizens and businesses that emanate from demographic developments and changing framework conditions in an expanding global economy. Secondly, there must be increased recognition that public sector innovation has a great impact on business sector performance in many ways (through business services, procurement, physical infrastructure, IT infrastructure, as source of innovation and platforms, etc.). The Public sector, in most countries, is large, and many ‘public services’ are provided by both state-owned and private enterprises. Interaction between businesses and the public sector is seen as an important source of innovation and a precondition for business efficiency and global competitiveness (Bloch, Bugge & Slipersaeter, 2010; Lee, Trimi & Kim, 2013:793; Ribiere & Tuggle, 2010:99; Ruiz-Jiménez & Fuentes-Fuentes, 2013:523). However, a major challenge in this regard is how to measure the extent and scope of public sector innovation, as well as to make comparisons between the sector and country, its impact on business development and society, as well as its dependence on businesses as the providers of goods and services to the private sector.

1.2 OVERVIEW OF PUBLIC SECTOR INNOVATION

The concepts of public sector organisations (PSOs) refer to those organisations whose control falls under the state. The concept connotes government departments and agencies that are fully or partially publicly funded

and controlled by the state government. Therefore, PSO innovation is conceived as the ‘creation, application of new, or introduction of new services, products or new processes with the aim to commercialisation in order to add economic value to the citizens and the organisation’ (Saunila & Ukko, 2012:355). It is these new services, products or processes that PSOs need to turn into viable commercial outputs in order to remain competitive in globalised markets. In another study (Petkovšek & Cankar, 2013:1331), public sector innovation refers to new products, services or new policies and programmes, new approaches, processes and methods of delivery that result in significant improvements in efficiency, effectiveness and/or quality outcomes. The case for innovation in the public sector organisations are driven by a number of factors such as the need for better and improved services to enlightened citizens (Albury, 2011:234; Nusair, Ababneh & Bae, 2012:182; Saunila & Ukko, 2012:355). The second case is to have an efficient and effective public sector that can deliver services of high value at lower costs (Lee, Hwang & Choi, 2012:149). The third case is that innovation results in improved standards of living of the people through the provision of quality services (Lee, Hwang & Choi, 2012:149). The fourth case is that innovation results in an improved revenue collection for the government (Albury, 2011). Innovation can help in reducing the unemployment rate currently facing Kenya, not to mention the efficient uses of resources through prioritising critical sectors that steer the economy to the growth paths (Conteh, 2012:470; Hope, 2012:137).

1.2.1 Global context

Studies conducted by the Organisation for Economic Co-operation and Development (OECD, 2008), World Bank Institute (WBI, 2008), Clark, Good and Simmonds (2008:6) on OECD member countries found that innovation has not featured so strongly in the United Kingdom (UK), Sweden, France, Australia, Japan, Canada and Brazil, among others. Similar studies on innovation have been carried out in the UK health sector (Ghinetti & Lucifora, 2013:429; Lee, Hwang & Choi, 2012:153; Nygren, Axelsson & Melin, 2013:455), and the findings indicate that innovation within public sector organisations (PSOs) has accelerated the rate at which healthcare services are delivered to the citizens. Similar study on innovation in the UK local government (Nygren, Axelsson & Melin, 2013:455; Rolfstam, Phillips & Bakker, 2011:464; Simon & Yaya,

2012:1038) on the adoption of e-Government, demonstrated a high level of citizen satisfaction with their services which citizens could access through the Internet and voice their concerns through the same channel. Researches and studies (Sabir & Sabir, 2010:214) suggest innovation as the most imperative factor to be considered for enhancing the competitiveness of a nation, industry and an organisation.

The underlying drivers for innovation commonly found in the PSOs are changing demographics (increase or fall in birth rates), ageing population, social changes such as the breakdown of the nuclear family, health and social problems, arising from new types of work (sedentary white collar jobs) and new lifestyles (Albury, 2011:227; Lee, Hwang & Choi, 2012:151). In the United Kingdom (UK), for example, the public sector accounts for about 40% of GNP, 20% of total employment and 30% of all professional level employment (Ghinetti & Lucifora, 2013:429; Windrum & Koch, 2008:6). In the United States of America (USA), it accounts for 15% of all employment and Sweden 30% of all employment. In Denmark although public sector account of 29% of all employment and constitutes a large part of the economy, the public sector innovations have received little attention (Kamarck, 2004; Lee, Hwang & Choi, 2012:153). Also similar trend is found in Finland and France, where public sector account for 22% and 21% respectively (OECD, 2005). Therefore, the economic contribution of PSOs in the economy cannot be overemphasised, in the development of the nations, particularly Africa countries.

1.2.2 Africa context

In Africa, public sector organisations are increasingly coming under pressure to justify their existence through calls for financial accountability, good governance, operational efficiency, improvements in product and service quality to the general public (Asogwa, 2013:142; Engida & Bardill, 2013:3; Gatere, Keraro, & Gakure, 2013:1010; Lankeu & Maket, 2012:267). In addition to these, other studies (Nusair, Ababneh & Bae, 2012:182; Stewart, 2014:241) indicate that, public sector innovators face a long list of obstacles such as: risk aversion, unsupportive processes, lack of access to new technology, lack of innovation focus in setting strategic directions, lack of feedback on ideas, a silo mentality, politicisation of issues, and fear for failure.

On the other hand, PSOs are also vested with the responsibilities for the provision of public goods and services, which are in their very own nature, form the essential and necessity of life to the general public. The examples of these goods and services are clean and safe drinking water, affordable health care to all, security, affordable education to all, and infrastructure (Barre, 2014:129; Kallio & Lappalainen, 2015:144). In fact, PSOs represent democratic and operate in a political environment, and therefore, obligated to follow policies that have effects on their operations and practices (Kallio & Lappalainen, 2015:44). The management of Africa's PSOs has been appointed partly on political merit that management may have to fulfil the financial obligations of their masters before considering the overall efficiency and profitability of the PSOs (see, Engida & Bardill, 2013:6). This is due to the fact that Africa's PSOs are politicised, an action which has demoralised public servants and impair their effectiveness as the custodians of the public service provision (Ngeve & Orock, 2012:217).

Labour division within the PSOs is invariably highly specialised. Task specialisations are clearly articulated and each employee has a specific set of functions clearly set out as his / her job description, which he /she must operate (Engida & Bardill, 2013; Gatere, Keraro, & Gakure, 2013:1012). The PSOs structures are highly centralised in terms of control and authority, with decision-making ends towards the autocratic, and eventually the command chain flowing downwards from top to the last person in an organisation.

1.2.3 Kenya context

The PSOs particularly in Kenya, function according to predetermined set of business strategies and tasks, which employees execute procedurally with a rigid blueprint (Kallio & Lappalainen, 2015:44; Lankeu & Maket, 2012:267). Consequently, PSOs culture has been seen as rather conservative, supporting knowledge exploitation instead of exploration, and with little tolerance for errors (Kallio & Lappalainen, 2015:44). This means that business processes and tasks are executed with a high degree of efficiency, though not with effectiveness (Asogwa, 2013:142; Mutula & Kalaote, 2010:68). These PSOs are also not effective because they do not address the reality of the surrounding external environment and do not influence it and are not

influenced by it (see, Sandhu, Jain & Ahmad, 2011:221). Public sector organisations in Kenya tend to be static and bureaucratic, that creates a situation in which new ideas are stifled. The environment within which PSOs operate is very different to that of the private sector (Lee, Hwang & Choi, 2012:149; Mutula & Kalaote, 2010:64). Social responsibilities, and different networks found in Kenya PSOs, give rise to a very different set of barriers and drivers for the diffusion of innovation in the PSOs. Public sector organisations are conservative, bureaucratic and slow moving and innovation developed elsewhere are belatedly adopted by Africa's PSOs (Hilgers & Ihl, 2010:68). PSOs in Africa are under political patronage by the government of the day that always influences their operations (Engida & Bardill, 2013; Khabusi, 1997). The studies (Engida & Bardill, 2013:6; Ngeve & Orock, 2012:215) further state that Africa's PSOs are characterised by inefficiency, poor coordination, poor management, and political interference, for example the states appointments senior most top positions. Chief Executives and other top officials in these organisations are, in most cases, related to or friends of Ministers in charge of these PSOs (Engida & Bardill, 2013:6; Ngeve & Orock, 2012:217). In turn, these officers often compromise their professional integrity for the purpose of enriching politicians (Khabusi, 1997; Ngeve & Orock, 2012:215).

However, the problem that seems to face the public sector organisations in Africa, particularly Kenya is how to measure the outputs of innovation activities in order to gauge the level of innovation in the sector. Studies suggest that, measure of innovation in the public sector need serious attention that calls for systematic and objective assessment (Eriksson, 2014:164; Oyelaran-Oyeyinka & Sampath, 2007). Studies on assessment of innovation have only been done in the West, with little devotion to Africa in particular (Eriksson, 2014:164; Sangiorgi, 2015:343; Reynoso, Kandampully, Fan & Paulose, 2015:157). Therefore, it is evident that more effort should be devoted to developing valid measures to specifically assess innovation in the public sector, particularly in Kenya (Aizcorbe, Moylan & Robbins, 2009; Dobni, 2008:540; NESTA, 2008:20). Various attempts have been made to come up with universally accepted measurements of innovation, yet these have only yielded less fruit with scholars disagreeing on a standardised measurement (Tan, 2004). National

Endowment for Science Technology and the Arts (NESTA, 2008:20) reports that development of innovation measurement for the public sector is still in its infancy.

Measuring innovation accurately and assessing its impact on economic activity is likely to result in an improvement of the efficiency of resource allocation in an economy both at the macro and microeconomic levels (Hoque, 2008:489). Hence, this makes it very important to come up with an accurate measuring instrument that will help PSOs to monitor progress with regard to service delivery and accountability to the general public. It is through this assessment that the public, to whom the PSOs are accountable, are able to evaluate the performance of this sector in terms of their innovativeness. Dobni's (2008:540) study suggests that an empirically driven scale can essentially be used as a metric to measure innovation culture in the PSOs. The study further reveals that there are performance implications related to innovation, which present avenues for further research. Vigoda-Gadot and Meiri (2008:307) in addition, states that PSOs innovation has been hampered by a paucity of literature and emphasised the need to develop rich literature in the field.

Tan (2004:22) in a study of the consequences of innovation in the public sector posits that, an indicator of innovation outcomes highlights three issues. Firstly, there is no real consensus on measuring innovation, let alone innovation outcomes. Secondly, the indicators still exhibit bias towards manufacturing rather than services, a trend that at least in academia is changing. Lastly, given such disparate indicators, the attempt to find innovation metrics based on the least common factors approach, that is, to group indicators together and seek commonalities among them is ultimately an arbitrary and unsatisfactory exercise.

There are two discrepancy types and levels of measures of innovation: the organisational and the political. Measures of innovation at organisational level relate to individuals and team-level assessments (Albury, 2011:231). Innovation in organisations can be assessed by means of surveys, workshops, consultants or internal benchmarking (Dobni, 2008). There are no universally agreed upon measures of innovation, which make it difficult to have a common general way to measure innovation today (Dobni, 2008; Tan, 2004:10).

At the political level innovation can be measured in terms of the country's competitiveness and Gross Domestic Product (GDP) (Conteh, 2012:465).

Innovation is a process in which valuable ideas are transformed into new forms of added value for the organisation, customers, employees and stakeholders (Dobni, Klassen & Nelson, 2015:5; Merx-Chermin & Nijhof, 2005:137). Innovation are instrumental in creating new jobs, providing higher incomes, offering investment opportunities, solving social problems, curing disease, safeguarding the environment, and protecting security (Ruiz-Jiménez & Fuentes-Fuentes, 2013:523; WBI, 2008). Stone, Bollard and Harbour (2009:17) state that governments around the world view innovation as a prerequisite for a competitive advantage in a globalised economy.

Reforms in the public sector organisations are undertaken for several reasons; for example, to reduce public spending, to improve effectiveness, to respond to new social demands, among others (Fatile & Adejuwon, 2010:146; Hope, 2012:130). No matter what leads to reforms, one thing is inescapable: Public institutions and public servants are an integral part of society. Thus, understanding the interplay between PSOs and the encompassing social context is fundamental to envision a strategy to carry out reforms. For a long time, academics and policymakers have been clamouring for 'ethical' or 'moral' reforms of the civil service (Fatile, 2010:147; Gatere, Keraro & Gakure, 2013:1011). However, these reforms should be accomplished in such a way that they offer PSOs protection to enable them to act in the interest of the public and not solely in the interest of those with political power.

1.2.4 Status of innovation in Kenya

The perceived challenges that face PSOs at large and in Kenya are complex and need immediate attention in order to bring PSOs on par with the increasing demands of the citizens (Kealesitse, O'Mahony, Lyod-Walker, & Polonsky, 2013:50). The identified challenges are inadequate funding, lack of clear policy on innovation, delivery pressures and administrative burden, continuous interference from politicians, poor rewards and incentives, population pressures, competitive pressures, and fiscal discipline (Engida & Bardill, 2013:6;

Gatere, Keraro & Gakure, 2013:1021; Stewart, 2014:241). The Africa Competitiveness Report further revealed that, Kenya's public institutions continue to be plagued by inefficiency, undue influence, and high levels of corruption (Africa Development Bank (AfDB) /World Bank (WB) (2009:23). Despite these claims, Kenya's innovative capacity is ranked 42nd in the world, with high company spending on research and development and scientific research institutions collaborating well with the business sector in research activities (AfDB/WB, 2012). The other study, world Global Competitive Index (GCI, 2013-2014:44) Report indicates that, Kenya's education system though educating a small proportion of the population, and its sophisticated financial markets by international standards, have been found to be the drivers behind the country's impressive ranking in the world. In addition, the Global Competitive Index (GCI, 2013) indicates that, Kenya's innovative capacity has ranked to position 46th out of the 148 countries surveyed, with high spending on R&D and good scientific research institutions that collaborates well with the business sector in research activities. However, this compared to the previous years 2009, shows that Kenya has dropped four positions. The drop in ranking can partly be attributed to the Kenya's health sector and security situations, which are viewed worrisome, ranked (131st), says the Report.

For example, Oyelaran-Oyeyinka and Sampath (2007) conducted study on Kenya's public sector innovativeness, which painted a gloomy picture on PSOs levels of innovation. On one hand, Kenya's PSOs tend to be characterised by little or no incentives, and workers are less motivated due to feeling that these are public organisations (Gatere, Keraro & Gakure, 2013:1020). On the other hand, PSOs have strong administrative and bureaucratic controls that tend to reflect standing orders of the Government Ministries ((Engadi & Bardill, 2013:5; Gatere, Keraro & Gakure, 2013:1020). Khabusi (1997) further posits that the degree of innovation in PSOs is negligible, because the bosses may not wish to accept ideas from subordinates. It is always believed that the boss knows best and may not accept subordinates' ideas however innovative they may be (Engida & Bardill, 2013:7; Khabusi, 1997:162). Recently, the government implemented an Economic Recovery Strategy in order to pull the country out of recession (Hope, 2012:134; Lankeu & Maket, 2012:266). This Economic Recovery Strategy aimed at creating opportunities for

productive employment, rebuilding sound governance structures, addressing major macroeconomic vulnerabilities such as weak budgetary position, large domestic debts, and distressed financial system (Engida & Bardill, 2013:7).

Despite some improved economic performance, Kenya remains characterised by low and declining savings with poor domestic capital formation (Oyelaran-Oyeyinka & Sampath, 2007:37). Kenya's annual GDP (2011-2012) registered a 4.5% growth with a real GDP percentage for the 2013 estimated to be 5.7%. This estimate was lower than many of other African countries (IMF, 2013). Viewed on the sectoral basis, Kenya's agricultural sector contributed 9% of GDP in 2012 (IMF, 2013). The performance of the Kenya's agricultural sector, like the rest of the economy, remains low due to numerous factors. The Agricultural sector has continuously suffered drought resulting in the deterioration of agricultural trade, which created a food shortage, and an escalation of prices for agricultural produce (Johannessen, 2013:1204; Oyelaran-Oyeyinka & Sampath, 2007:37). The United Nations Development Programme (UNDP) (2006) ranked Kenya number 152 worldwide in 2004 on Human Development Index with a value of 0.491 according to a study. The reason for this is the country's performance on life expectancy, education levels, and decent living standards that have worsened over the past 15 years (UNDP, 2006). The knowledge infrastructure measured in terms of education and school enrollment and investment in Research and Development (R&D) expenditure was not available, while Foreign Direct Investment (FDI) is almost negligible (Oyelaran-Oyeyinka & Sampath, 2007:40).

Although Kenya has achieved some marked improvement on competitiveness when compared with other African countries, Global Competitiveness Index (GCI) (2013:44), ranked the country 96 out of 148 countries in 2013, ten places down from its previous rank of 106 in 2012. However, Kenya's innovative potential capacity is ranked an impressive at 46th out of 148 countries surveyed, with high company spending on R&D and good scientific research institutions that collaborate well with the business sector in research activities (GCI, 2013). UNDP (2001) Report, views Kenya to have failed to diffuse old technology to a large part of its population. On the Intellectual Property Rights (IPR) regime, Kenya's patent registrations in 2001 amounted

to 61 with two of these being registered by residents and the rest by non- residents. In addition to this, the number of international patents in Kenya amounted to a total of 89,180 in 2002 (WIPO, 2007). These figures are an indication that there are inadequate rigorous innovative activities in the entire economy.

Kenya has assigned industrial programmes a central role in her efforts to create economic growth and increase the pace of industrialisation, but still the country does not have an integrated innovation policy strategy to guide its performance in both traditional and new technology sectors. It is argued that, the country's innovation policy framework is a patchwork of several policies, which are not interlinked thus resulting in some sectors not only remaining largely fragmented, but also limited by performance in the economy as a whole.

However, this since has been finalised and in the year 2009, the Kenya government managed to transform STIP into Kenya National Innovation System (KNIS) to help it achieve Vision 2030, with emphasis on ICTs as key factor in driving its developmental agenda (Koria, Bartels, Andriano & Koeszegi, 2014:18; Republic of Kenya, 2011). This development is attestation that, innovation policy has not existed for long in Kenya, therefore a recent development, which is yet to realise its potentials. Despite these developments in area of starting her National Innovation Systems (NIS), Kenya has not featured prominently at the international scene regarding ICTs accessibility and usage. For example, the Global Information Technology Report 2013 (GITTR, 2013), ranked 92 out of 144 countries surveyed. Though Kenya performs well in the ICTs sophistication relative to other Sub-Saharan African countries, but the country has failed to make ICTs accessible to the larger population compared countries such as Ghana.

In any domain, innovation includes firms, universities, public research institutes, public sector and other actors, which provide the necessary infrastructures that support innovation. Engida and Bardill, (2013:7) and Global Competitive Index (GCI) (2013) also found that Kenya has continued to demonstrate inherent weakness in several institutions that are fundamental to the creation of new knowledge and the use of already existing knowledge in innovation activities. Institutions providing financial support to promote local

innovation and entrepreneurship have not been performing well, and have been constantly on the decline since the year 2000. This further confirms why Kenya's PSOs are not viewed as innovative as one would expect. In another study (Johannessen, 2013:1204) states that, lack of organisations innovation may sometimes lead to performance costs for businesses, of which Kenya is not an exceptional. This is because poor performance costs affect a system's efficiency and performance negatively.

Although Kenya has a very strong base of PSOs dedicated to research and standard setting has been able to create a flourishing framework for innovation (GCI, 2013:44). Several factors have contributed to this situation: the lack of innovation priorities, inadequate funding for public research organisations, inadequate scientific skills, and weak systematic linkages for interactive learning (GCI, 2013:44; Oyelaran-Oyeyinka & Sampath, 2007). In a similar vein, previous studies on innovation in developing countries indicated that developing countries, particularly Kenya, are by nature, problematic, characterised by poor business and governance conditions, have low educational levels, and mediocre infrastructures GCI, 2013:44).

1.3 STATEMENT OF THE PROBLEM

Literature reviews indicate that few studies on assessment of innovation have been done in developing nations, particularly Kenya (Clark, Good & Simmonds, 2008; Oyelaran-Oyeyinka & Sampath, 2007; Petrou & Daskalopoulou, 2013:52). Studies (Eriksson, 2014:164; Reynoso, Kandampully, Fan & Paulose, 2015:157) for example, point out that, academic discourses of service creation and innovation tend to investigate well-established economies, which appears insufficient for several reasons. In addition, scholars (Djellal, Gallouj & Miles, 2013:102) state that, researchers have neglected study of innovation in the public sector. In particular, emerging economies are growing at faster rates than are developed economies. This is not an exception of Kenya's economy and its public sector. Public sector organisations have failed to provide adequate services to the general public in Kenya for several reasons (Engida & Bardill, 2013:7). Among these are: a lack of clear policy on innovation, measurements, bureaucracy, legislative or regulatory constraints, poor coordination, delivery pressures and administrative burden, lack of adequate funding, poor rewards and

incentives to innovate, a culture of risk aversion, poor skills in active risk taking, maladministration, and governmental patronage (Agolla & Van Lill, 2013; Engida & Bardill, 2013:7).

Oyelaran-Oyeyinka and Sampath (2007) and Eriksson (2014:164) point out that, innovation in Kenya's PSOs are lacking both in theoretical and practical dimensions which in turn calls for more studies to understand the nature of innovation. Other studies (Clark, Good & Simmonds, 2008; Eriksson, 2014:164; Walker, Damanpour & Devece, 2010:380) indicate that, research into the assessment of innovation in the PSOs are relatively recent and therefore needs more attention. Clark, Good and Simmonds (2008) studies in the UK, and Mostafa (2005) in Egypt, emphasized the importance of PSOs within the economy and the importance of innovation to the delivery of services to the general public at affordable prices. In addition, they found that although studies of innovation in PSOs are on the increase, they suggest that the formal and systematic measurement and reporting of innovation needs more attention.

A variety of drivers lie behind the current push for innovation in Kenyan PSOs, the most prominent being the needs to provide prompt, improved and personalised public services to the citizens and employment to the ever increasing number of college graduates. The traditional, inefficient and non-accountable PSOs cannot cope with the pressure of Kenya's population, which is a staggering 39.9 million, according to Kenya National Bureau Statistics (KNBS, 2010). Hence, there is an urgent need to introduce improved methods in Kenya's PSOs in order to provide improved services to its citizens.

AIMS OF THE PRESENT STUDY

The present study focuses on assessment of innovation in the public sector organisations with the aim of developing a framework that can be used by the public sector organisations in Kenya in order to drive their competitiveness in delivering better services to the citizens. In addition to the above, the study explores drivers, barriers, overcoming barriers and innovation outcomes in the Kenya's public sector organisations. Therefore, in order to fulfil the aims of the present study, the following six specific research questions were investigated:

1.4 RESEARCH QUESTIONS

1. What is the status of innovation in Kenya's public sector organisations?
2. What are the specific organisational drivers and barriers to innovation in Kenya's public sector organisations?
3. How can innovation be assessed in Kenya's public sector organisations?
4. To what extent is the Kenya's government promoting innovation in public sector organisations?
5. How can barriers to innovation be overcome in Kenya's public sector organisations?
6. How can innovation be improved/enhanced in Kenya's public sector organisations?
7. What innovation model / approaches are applicable to Kenya's public sector organisations?

1.5 OBJECTIVES OF THE STUDY

The main objective of the present study was to measure and assess the level of innovation and to relate them to the performance and service delivery of the Ministry of Regional Development Authority in Kenya. Therefore, the specific objectives of this study are to:

1. Explore the extent to which Kenya's public sector organisations are innovative.
2. Explore the specific organisational drivers and barriers to innovation in the public sector organisations in Kenya.
3. Find out how innovation can be assessed Kenya's the public sector organisations.
4. Explore the extent to which the Kenya's government is promoting innovation in the public sector organisations.
5. Examine the specific factors that can be used to overcome barriers to innovation in Kenya's public sector organisations.
6. Explore how innovation can be improved/enhanced in Kenya's public sector organisations.
7. Develop innovation model that is applicable to Kenya's public sector organisations.

1.6 HYPOTHESES

From the literature review, the following hypotheses were tested in order to find out the relationship between perceived factors that drive innovation and barriers in Kenya's public sector organisations.

H1- Internal factors are statistically significantly directly positively related to innovation indicators.

H2- Internal factors are not statistically significantly related to innovation indicators mediated by barriers.

H3- Overcoming barriers are positively related to innovation indicators mediated by barriers.

H4- External factors are not statistically significantly directly related to innovation indicators mediated by innovation barriers.

H5- External factors are statistically significantly directly related to innovation indicators.

H6- Barriers are not statistically significantly directly related to innovation indicators.

1.7 RATIONALE FOR THE STUDY

A substantial body of research has emerged in the past four decades on innovation in the private sector, yet a significant knowledge gap exists with regard to the assessment of innovation in public sector organisations, where quality research on the subject is rather limited (Albury, 2011; Clark, Good & Simmonds, 2008; Eriksson, 2014:164; Mulgan & Albury 2003; Windrun & Koch, 2008: 9). In addition to this, most studies conducted on public sector innovation have been carried out in the West, with only a few in Africa, particularly in Kenya's public sector (Oyelaran-Oyeyinka & Sampath, 2007; Reynoso, Kandampully, Fan & Paulose, 2015:157). Therefore, the present study assesses innovation in selected Kenyan public sector organisations, with specific focus on the drivers to innovation, barriers to innovation, overcoming barriers to innovation, and innovation outcomes.

In the next sub-section, the study briefly discusses the scope and SWOT analysis of the surveyed organisations as an exploratory secondary data to inform the empirical findings in the later Chapters.

1.8 SCOPE OF THE STUDY

This study focused on the Ministry of Regional Development Authorities (MORDAs) - Nairobi, Lake Basin Development Authority (LBDA) in Nyanza Province and Kerio Valley Development Authority (KVDA) in Rift Valley Province. The units of analysis were individual employees, groups and organisation level.

The Ministry of Regional Development Authorities (MORDAs) was established under the Presidential Circular No.3/2003 on the organisation on the government to provide policy guidance, enhance capacity building, management oversight and support to Regional Development Authorities (RDAs) (MORDAs, Strategic Plan, 2008-2012).

1.8.1 The Ministry mandate

The mandates of the Ministry of Regional Development Authorities (MORDAs) are;

- Formulation, implementation and monitoring of Regional Development legislations regulations, policies.
- Giving policy guidance to RDAs.
- Facilitating and representing RDAs in the government.
- Development, implementation and coordination of programmes in the regional development sector.
- Promoting management and conservation of the natural resource base.
- Collecting, collating, maintaining and managing information and data in regional development.
- Enhancing capacity building in RDAs.
- Management oversight and support to RDAs.

MORDAs Strategic Plan (2008-2012) highlights the importance of regional development as critical to wealth creation in the Kenyan economy. The Ministry of Regional Development Authorities contributes to Kenya's rural development through its six Regional Development Authorities. The regions covered are shown in Figure 1.1 below. The six RDAs are listed below; Tana and Athi Rivers Development Authority (TARDA); Kerio Valley Development Authority (KVDA); Lake Basin Development Authority (LBDA); Ewaso Ng'iro North Development Authority (ENNDA); Ewaso Ng'iro South Development Authority (ENSDA) and Coast Development Authority (CDA).

A situational analysis of strengths, weaknesses, opportunities and threats (SWOT) conducted by the Ministry of Regional Development Authorities (MORDAs) aimed at presenting a critical assessment of the environment in which the Ministry operates. The Ministry's SWOT analysis, revealed:

Strengths: Existence of Regional Development policy; existence of regional development directorate; financial support from the government and development partners; existence of well-established RDAs countrywide with clear legal mandates for integrated regional development; development of balanced and equitable regional development; and improved public sector reform initiatives.

Weaknesses: The Ministry weaknesses are: inadequate monitoring and evaluation capacity in the Ministry and RDAs; regional development policy not well aligned with the existing legal framework and needs review; inadequate middle technical staff; and weak IT infrastructure.

Opportunities: The opportunities available to the Ministry are: abundant natural resources for integrated development; opportunities for investments and wealth creation through RDAs; existence of Public Private Sector Partnership policy; support from development partners; availability of devolved funds to support regional development programmes.

Threats: The Ministry currently faces the following challenges: overlapping and conflicting mandates among government ministries; trans-boundary natural resource/issues/conflicts; high poverty levels in the regions

under various RDA jurisdictions; land tenure systems that are not supportive of effective development and management interventions; resource-use conflicts in the RDAs area of jurisdiction; high prevalence of HIV/AIDS; low funding; and environment degradation (MORDAs, Strategic Plan, 2008-2012).

In addition to its situational strengths weaknesses, opportunities and threats (SWOT) analysis, the Ministry of Regional Development Authorities conducted an environmental scan – PESTEL-which is an acronym for political, economic, social, technological, environmental and legal.

Political legal environment- Regional Development Authorities (RDAs) have in the past been located in different ministries depending on the government of the day. The institutional instability arising from the transfers from one ministry to another has led to lack of a clear stance on the part of the government on regional development. However, the government has now established the Ministry of Regional Development Authorities to spearhead regional development in the country.

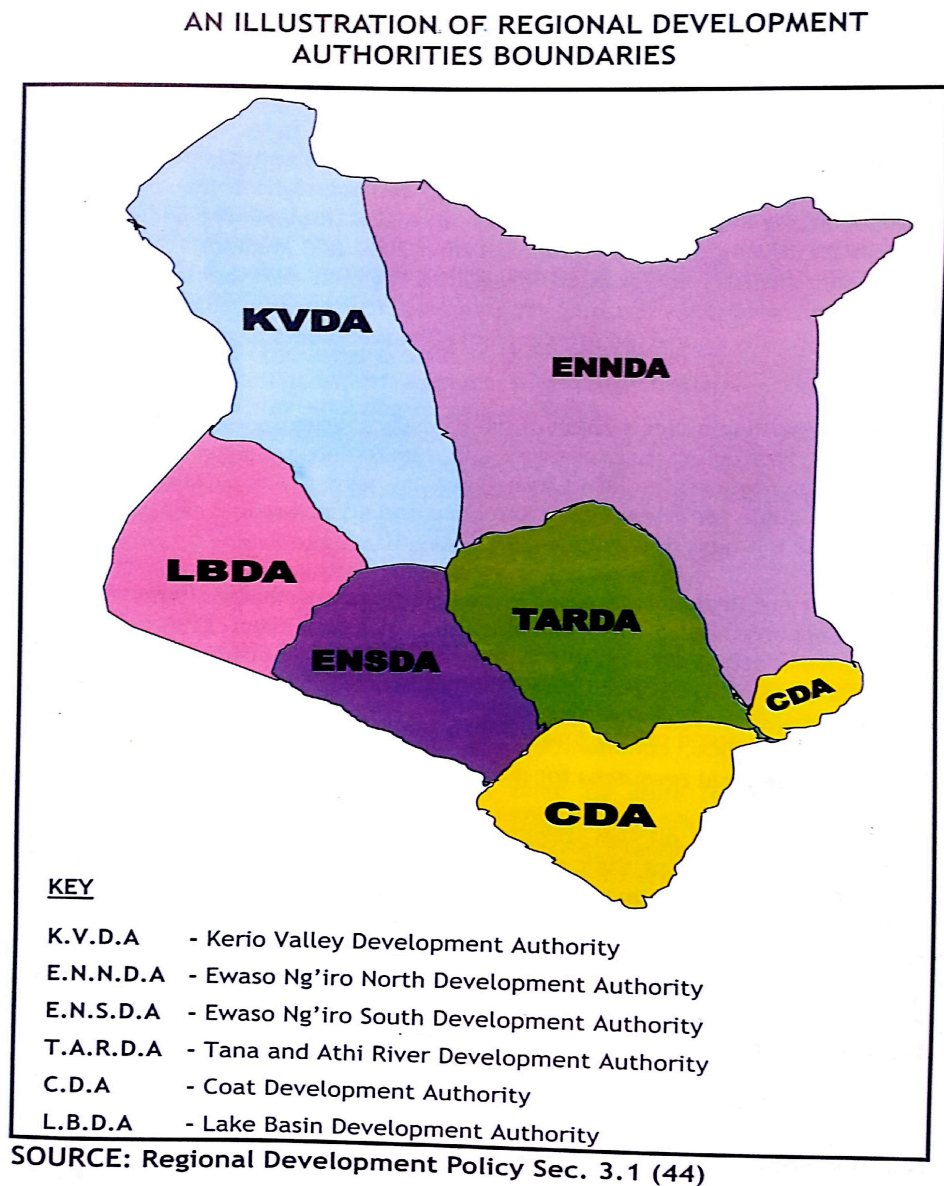
Socio-economic environment – Currently there are challenges to rapid socio-economic growth in the country because of weak macro- and micro- economic policies, unfavourable governance reforms, unbalanced development, inadequate infrastructural development, low human resources development and slow public service reforms (MORDAs, Strategic Plan, 2008-2012).

Technological environment – There has been a slow adoption of modern technology in the MORDA and RDAs. To tap into benefits of modern technology, especially ICT, MORDAs has embarked on mainstreaming its operations within the government e-policy use of technology for effective and efficient service delivery (MORDAs, Strategic Plan, 2008-2012).

The present study conducted SWOT analysis on the surveyed organisations to enable it to gauge the status of innovation in the public sector organisations in Kenya. The SWOT analyses of the surveyed organisations indicate that there are many challenges and opportunities that shed light on the status of the innovative capacity and capabilities. The information from the SWOT analyses will be used to support or refuted some

empirical findings later in the present study and to strengthen the findings in later Chapters, of the drivers, barriers, overcoming barriers and innovation outcomes.

Figure 1.1 Map of Kenya showing Coverage of MORDAs



CDA = Coast

(Source: MORDAs, Strategic Plan 2008-2012)

The map of Kenya above indicates six RDAs covering the eight provinces in Kenya. The study areas are Nyanza, Nairobi and Rift Valley provinces where Lake Basin Development Authority (LBDA) and Kerio Valley Development Authority (KVDA) are operating. Nairobi province is the host Ministry of the two public sectors for the study, where the Ministry of Regional Development Authorities is located.

During the course of the present study, a number of technical terms were encountered and used whose meaning perhaps could not be overlooked. Therefore in the following sub-section, an attempt has been made to define such technical terminologies as used in the present study, and also in other previous studies.

1.9 DEFINITIONS OF TERMS

Creativity – This means generation of new ideas, production of novel, useful, original ideas by an individual or a group of individuals working together (Amabile, 1988).

Innovation – This refers to volume of sales related to notable innovation, case studies of successful innovation, or annual measure of productivity (Clark, Good and Simmonds, 2008:13).

Innovation Impacts – This refers to commercial performance of public sector organisations (Liu, 2011:245).

Innovation Inputs- This refers to annual expenditure on innovation, for example numbers of scientists and engineers; capital expenditure and case studies of new joint ventures (Clark, Good and Simmonds, 2008:13).

Innovation Outputs – This is defined as the number of patent registrations, size of patent and licence portfolios, volume of licence income, or number of new products and services implemented in the PSOs (Clark, Good and Simmonds, 2008:13).

Organisational Creativity – It refers to the ideas generation by the organisation employees that are original in nature and useful to drive earlier ideas that have already been generated by the organisational members (Yström, Aspenberg & Kumlin, 2014:72).

Organisational Innovation – This is the application of new organisational methods or arrangement (Clark, Good and Simmonds, 2008).

Policy Innovation – This means new policy directions and initiatives that are instrumental in enhancing innovative culture in the PSOs (Williams, Windenbank, Baric & Nadin, 2013).

Process Innovation – This refers to implementation of new or significantly improved method of production in the organisations (Clark, Good and Simmonds, 2008).

Product Innovation- This is defined as the introduction of a good or service that is new or which represents a significant improvement over its predecessors (Clark, Good and Simmonds, 2008).

PSOs – These refer to organisations that are under government control and sometimes referred to as PSO organisations. They are a creation of the legislative process through an act of parliament to provide goods and services to the general public. Their operations are not dictated by profit motives, but rather by social welfare drives (Public goods).

The subsequent sub-section summarises the structure of the present thesis, under different Chapters.

1.10 STRUCTURE OF THE THESIS

Chapter 1

Chapter 1 comprises the introduction and the background of the study. It also highlights the statement of the problem, research objectives, questions, and significance of the study.

Chapter 2

This consists of the theoretical foundation, conceptual framework, synthesis and structural model that underpin the present study.

Chapter 3

This deals with the literature review on the study. In addition, it specifically focuses on measurements, drivers, barriers, strategies to overcome barriers, and benefits of innovation outcomes.

Chapter 4

The chapter covers research design and methodology. It includes research philosophy, research approach, research strategies, and types of research design, research methods and sampling methods.

Chapter 5

This chapter deals with data analysis both qualitative and quantitative using statistical tools.

Chapter 6

This chapter deals with the discussion of the findings and comparison with the literature reviewed earlier during the study.

Chapter 7

This chapter comprises the summary of the conclusion and contribution of the study both in theory and practice. The future direction will also be highlighted in this section.

Chapter 8

The chapter reflects on the philosophical and methodological of the study. It highlights the knowledge gained through the application of the mixed methods research and triangulation approaches, and challenges and opportunities available to future studies in innovation.

1.11 SUMMARY

This chapter comprises the introduction and background of this study, which highlights innovation in the PSOs. It also focuses on the problem statement, research objectives and questions. In addition it discusses the justification and scope of this study based on the background of the study. In the next chapter, the study will review the theories and concepts related to innovation in the public sector organisations, as postulated in the research objectives, questions and hypotheses culminating in the development of a structural model for the present study.

CHAPTER 2 THEORETICAL FOUNDATION

2.1 INTRODUCTION

In Chapter 1, the study reviewed the relevant literature on global perspective innovation on public sector organisations, and then narrowed down to Africa and Kenya in particular, culminating in the development of the study research questions, objectives and hypotheses. Chapter 2 deals with the theoretical foundation and the conceptual framework that underpin the present study. Theoretical foundation and conceptual framework constitute the guiding principles that lay down the path of the research study. It is argued that the theoretical and conceptual framework enables the researcher to accomplish a research plan in a systematic and logical manner. The first examined three models as follow: Determinants of innovation model (Andriopoulos, 2001:835), the second, the assessment of work environment model (Amabile *et al.*, 1996:1154), and finally the basic model of organisation innovation (Nyström, 1990:145). Thereafter, the study will critically review three organisation theories as follow: Organisation theory, systems theory, and social learning theory. After the critical appraisal of these models and theories, a systematic synthesis of innovation concept from different scholarly perspectives will be undertaken. Finally, the study developed a conceptual framework and structural model to guide the present research as discussed in the following sub-sections.

The main purpose of the present study was to develop a model that could be applicable to public sector innovations specific to the Kenyan context. As such, it was imperative that a review of a number of models and theories of organisation, and innovation fundamental to the success of any organisation in today's global market form the basis of the present study's theory building block. The current study starts with the analyses of the models that have contributed to the innovation theories and concepts (Amabile, Coon, Conti, Herron, & Lazenby, 1996:1159; Andriopoulos, 2001:835; Bandura, 1977; Nyström, 1990). The foregoing earlier scholars and theorists are supported by the recent developments in the field (Fu & Xiong, 2011:208; Lee, Hwang & Choi, 2012:159; Li, 2012:72; Sun, Shih, Hsu & Chen, 2013:367; Valencia, Valle & Jiménez, 2010:474). Therefore, in the subsequent sections, the study examines these theories and concepts as they

relate to innovation in PSOs. Thereafter the contributions of the organisation and systems theories in relation to innovation in the public sector organisations will be explored in relation to the context of the present study.

2.2 DETERMINANTS OF INNOVATION MODEL

Andriopoulos' (2001:835) determinants of innovation model identified five major factors of organisation innovation as demonstrated in Figure 2.1. The factors identified as determinants of organisation innovation are organisational climate, organisational culture, resources and skills, structure and systems, and leadership style.

These factors have been briefly discussed under the following sub-headings:

2.2.1 Organisational culture

Every employee needs to understand and accept the core principles and values that apply to everyone in the organisation (Andriopoulos, 2001:836; Galindo & Mendez-Picazo, 2013:511; Li, 2012:76; Valencia, Valle & Jiménez, 2010:474). Andriopoulos suggests that employees can only be encouraged to think creatively if they are not afraid of criticisms and punishment by fellow workers and management. Valencia, Valle and Jiménez (2010:474) posit that organisation culture can enhance product / service innovation, or inhibit innovation depending on the values that culture fosters. It is argued that culture needs to foster creativity, entrepreneurship, openness, and risk-taking for an organisation to be innovative. On the other hand, an organisation must try to avoid hierarchical cultures that emphasise internal control, close adherence to rules and regulations and internal orientation.

2.2.2 Structure and System

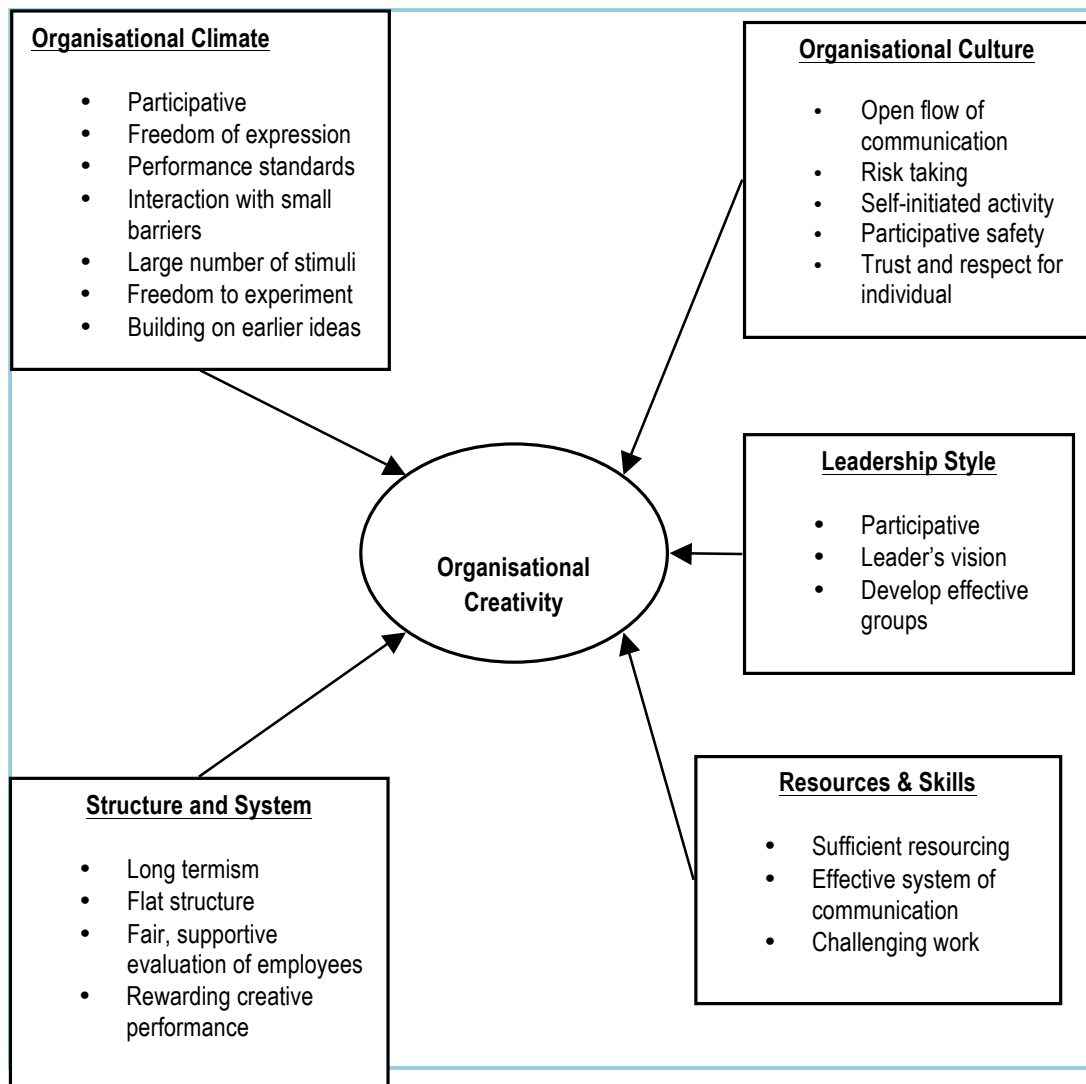
Organisational factors that were identified by this theory include long-termism, flat structure, fair supportive evaluation of employees, and rewarding performance in the organisation. Organisation leaders must therefore

put in place appropriate systems and procedures, which emphasise that creative effort is a top priority within the organisation (Galindo & Mendez-Picazo, 2013:511; Valencia, Valle & Jiménez, 2010:475).

2.2.3 Resources and skills

This theory proposes that organisational creativity also requires the organisation to make strategic choices with regard to their human resources. This involves striving towards the attraction, development and retention of creative talent, if organisations want to remain competitive (Azis & Osada, 2010:180). This theory proposes sufficient resourcing, an effective system of communication and challenging work that will not only appeal to employees, but also motivate them and bring out the best performance. Resources and skills are so critical that if nurtured well by the organisation management, then creativity will naturally thrive in the organisation (Galindo & Mendez-Picazo, 2013:511; Sun *et al.*, 2013:368). These findings have been supported in the recent literature (Li, 2012; Sun *et al.*, 2013:369; Valencia, Valle & Jiménez, 2010:474). These scholars identified organisation resources and skills as key critical factors contributing to successful innovation in any organisation, apart from the organisation culture and leadership.

Figure 2.2 Determinants of organisational creativity



Source: (Andriopoulos, 2001:835)

2.2.4 Leadership style

In the previous sections, the study found culture, resources and skills as factors that enable organisations to foster innovation. Leadership is very critical for an organisation's innovation because leadership provides the entire necessary infrastructure for creative thinking (Azis & Osada, 2010:180). A participative leadership style, which allows employees to engage in decision-making, is instrumental in creating a pool of diverse

ideas from employees, ideas that flow freely without employees feeling criticised or threatened by management. It is this pool of diverse ideas like a seedbed for the organisation's innovation. For example, Crumpton (2012:100) further adds that a creative leader will find ways to encourage organisations and people of all ages, to ask the questions that will lead to innovative ideas and concepts. Apart from this, leaders are crucial in creating an organisation climate that encourages creativity and innovation.

2.2.5 Organisational climate

To a large extent, organisational climate is concerned with an atmosphere that is favourable and encourages organisational creativity and innovation (Galindo & Mendez-Picazo, 2013:511; Sanz-Valle, Naranjo-Valencia, Jiménez-Jiménez & Perez-Caballero, 2011:1007; Valencia, Valle & Jiménez, 2010:180). A working atmosphere should not only be favourable to innovation, but also requires participation and freedom of expression, as well as demands for performance standards (Crumpton, 2012:100). For example, Crumpton (2012:100) further states that innovation requires leaders who are willing to invest in an open and creative culture that will foster new ideas and break standard or conventional thinking in carrying out professional responsibilities.

2.2.6 Discussion

Although this model informs us of the determinants of organisational innovation by highlighting important elements that determine the level of creativity, it fails to give us the main drivers and measurement of innovation in the public sector. Another weakness of this model is that, it is not possible to transfer all the determinants in the private sector to the public sector because of the complexity of public sector organisations. Whereas the private sector focuses on pursuing profit maximisation and shareholder return, the public sector, on the other hand, is concerned with the effective management of money and other resources to deliver the strategic objectives and services to the general public and stakeholders. In order to understand how innovation takes place in the public sector, it is important to examine organisational strategy apart from

leadership, organisational climate, resources and skills, structure and systems, and organisational culture that have been hypothesised in this model as the determinants of organisational innovation. In brief, if this model is applied to the public sector in its generic model mechanistically without changing its format, it is likely to pose serious challenges because it is more applicable to the private sector than the public sector whose structures differ. The present study was intended to fill these voids by developing an integrated innovation model for the public sector through exploration of corporate strategy as a driver to innovation in the public sector.

2.3 ASSESSMENT OF THE WORK ENVIRONMENT MODEL FOR CREATIVITY

Amabile *et al.* (1996:1154) conceptualises innovation in organisations as originating from five components namely: encouragement of creativity, autonomy of freedom, resources, pressures, and organisational impediments to creativity. Amabile *et al.* state that all innovation begins with creative ideas. This model is summarised in Figure 2.2 below. On one hand, the arrows with plus signs or positive signs represent the stimulants (drivers). On the other hand, the ones with negative signs represent obstacles or barriers. Although the model plays an important role because of its applicability and being the known model to have postulated work environment scale in a robust way, the model failed to highlight the measurement of the creative and innovative outcomes in the organisation, a gap that this research hopes to fill.

2.3.1 Encouragement of creativity

This refers to encouragement and development of new ideas. This operates at three levels in the organisation, namely, organisational, supervisory, and work group supports (Amabile *et al.*, 1996). The model goes further to explain that risk taking and idea generation, and valuing of innovation from top to lower levels are critical to creativity (Valencia, Valle & Jiménez, 2010:75). Others are leadership development to enhance the knowledge, motivation, and skills of managers to engage staff; cross unit project groups and work experience; specific purpose working groups; promotion of involvement in professional associations; team development; adoption of an innovation process model; and provision of practical innovation techniques

(Leong & Anderson, 2012:496). In addition, the provisions of appropriate reward system that recognizes both individual and work teams would provide supportive work environment where employees have the freedom and motivation to creatively carryout work assignments.

2.3.2 Resources

Research indicates that resources are very critical to the creativity efforts (Sun *et al.*, 2013:371). Resource limitations can have negative psychological effects leading to the belief about the intrinsic value of the projects that have to be undertaken (Amabile *et al.*, 1996; Sun *et al.*, 2013:371). In addition, other studies (Suwannathat, Decharin & Somboonsavatdee, 2015:531) point that, if resources are plentiful, the rules to adapt new projects or policies becomes relaxed, meaning potential innovative programmes are likely to be accepted. This is because, the organisational members have the necessary resources to experiment with when implementing or initiating innovative projects or programmes. Sufficient resources are very instrumental in fostering innovation, whereas insufficient resources stifle innovation capability of the organisation. Resources include both physical (raw materials) and intangibles (human skills, knowledge, experiences). These resources can be drawn from internal as well external environments, therefore emphasises on the organisation's relationships with its environments (Suwannathat, Decharin & Somboonsavatdee, 2015:531).

2.3.3 Pressures

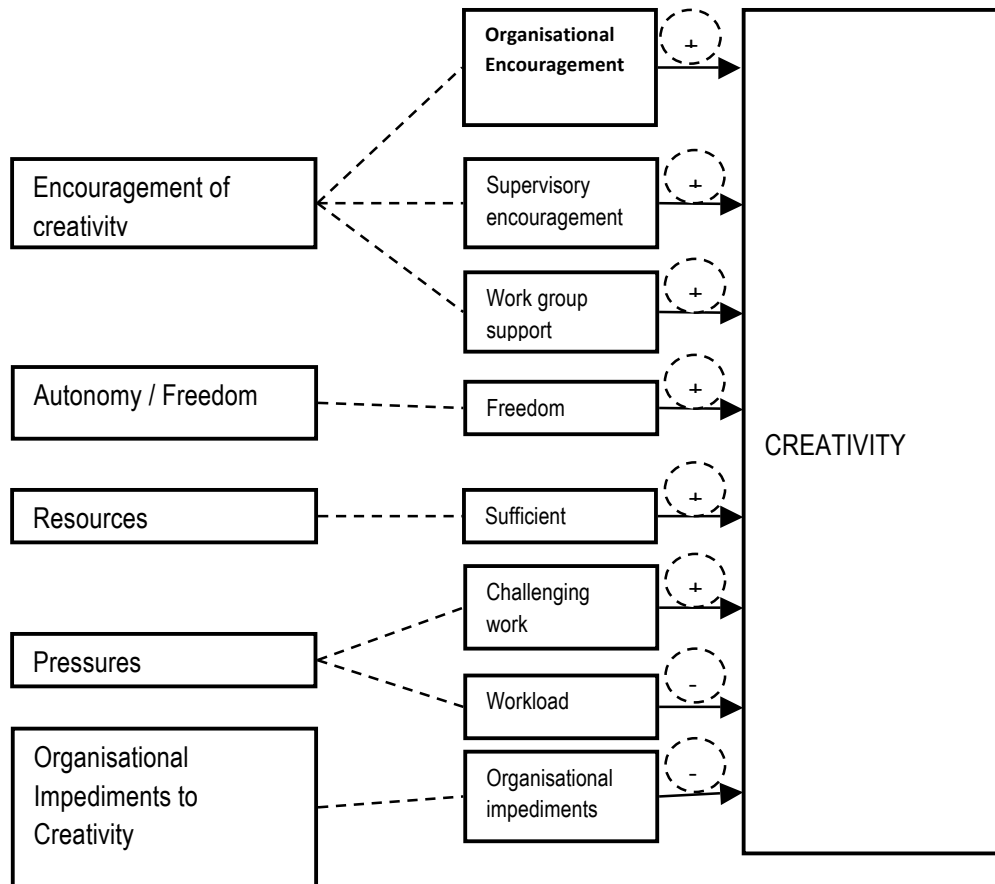
Pressures emanate from workload that individual employee is expected to carryout. The pressures as a result of excessive workload can create challenges to employees that leave them with no time to engage in creative thinking, which is a precursor to innovation (Agolla & Van Lill, 2013; Amabile *et al.*, 1996). In addition, pressures such as challenging work or tasks may motivate employees to think creatively. Studies have shown that challenging work motivate employees and make them enjoy their work. In such a scenario, employees who pereceive their work as challenging may deveote time and energy on creative thinking. Innovation is nurtured and generated in an environment where employees have rooms to think outside the box as opposed

to all round pre-occupied with how to deliver and meet deadlines. Such pressures as a result of excessive workload can result in employees burn out which may not be of benefit to the organisation.

2.3.4 Supervisory management

This means the role of supervisors with regard to how goals are made clear to the subordinates, open interactions between supervisor and subordinates, and supervisory support of team's work and ideas. Apart from good and effective supervisory management, managers should disseminate and promote knowledge combination capability among all members of their organisation to support the development of innovations and generate better entrepreneurial results (Suwannathat, Decharin & Somboonsavatdee, 2015:531). They should also identify the barriers that impede employees from combining their knowledge and attempt to eliminate them (Girard & McIntyre, 2010:76; Ruiz-Jiménez & Fuentes-Fuentes, 2013:535). Similarly, another study (Sandhu, Jain & Ahmad, 2011:221) demonstrates that management approach requires increasing teamwork, limiting the number of rules, and obtaining more value-driven management and decentralisation in public sector organisations in order to create an environment that fosters creativity and innovation. It is important to reward individuals as well as teams, particularly on specific projects relevant to innovation (Suwannathat, Decharin & Somboonsavatdee, 2015:531).

Figure 2.3 Assessing work environment for creativity model



Source: (Amabile *et al.*, 1996:1159)

For example, Loewenberger, Newton and Wick (2014:193) add that supervisory encouragement is concerned with awareness of a clear vision, encouragement and support from upper management and from the immediate supervisor or line manager.

2.3.5 Autonomy / Freedom

This model points out that creativity is nurtured when individuals and teams have relatively high autonomy in the day-to-day conduct of work. This gives employees a sense of ownership and control over their own work. Study (Valencia, Valle & Jiménez, 2010:75) indicate that an organisation should pay attention to foster a

culture of creativity, entrepreneurship, openness and risk-taking by encouraging employees' autonomy and freedom of expression, free from unnecessary criticism of ideas generated. Intrinsic rewards such as increased autonomy and improved opportunities for personal and professional growth may support the innovation process (Suwannathat, Decharin & Somboonsavatdee, 2015:531).

2.3.6 Organisational impediments to creativity

A plethora of research indicates that internal strife, conservatism, and rigid, formal management structures within organisation impede creativity (Li, 2012:76; Valencia, Valle & Jiménez, 2010:75). Amabile (1988) further points out that individuals are likely to perceive each of these factors as controlling, and may lead to increases in the intrinsic motivation, and corresponding decreases in the intrinsic motivation that is necessary for creativity.

2.3.7 Discussion

This study adopts Amabile *et al.*'s (1996:1154) assessment of work environment model for creativity since it is the one that is more appropriate to this study. This model helps lay down the foundation of organisational innovation. However, like Andriopoulos' (2001) determinants of creativity model, it suffers some limitations with its applications to public sector organisations without changing its format too. The Amabile *et al.* (1996) model came as a result of a research that was conducted in private sector manufacturing organisations in the United States, which makes it difficult to apply it wholesale to the public sector due to the differences in the nature of the two sectors. Secondly, this model examined the work environment that stimulates innovation, but fails to give us the factors that drive innovation in PSOs, and the assessment of innovation. The work environment may be conducive to creative activities but that alone may not translate into innovation if it fails to result in commercialisation of the services and products. In short, the model failed to give innovation outcomes, but only emphasised the importance of a work environment that is conducive to creativity. Knowing innovation outcomes would enable us to understand what factors to take into consideration in order

to measure public sector innovation capacity. In the public sector also, the factors that are responsible for a creative work environment are by far quite different from those of the private sector (Lee, Hwang & Choi, 2012:149).

For example, in the case of the public sector, policy and demand from the citizens play an important role in creative work environment, whereas in the private sector, competition from competitors, shareholders returns and profit maximisation drive innovation capacity (Lee, Hwang & Choi, 2012:149). In the Public sector, the key stakeholders include members of the public or a specific community, governments and government bodies, businesses and industry bodies and pressure groups. The knowledge about these key stakeholders' wants and needs allows organisations to shape their value proposition (Albury, 2011; Stankovic, 2013:150). Each of these stakeholders may influence the success of an organisation in different ways either through the consumption of the products or services, while others might provide funding or resources (Rolfstam, Phillips & Bakker, 2011:464). Stakeholders can be looked at from two angles, one as input and secondly as an output. From the shortcomings of these two models, this research tries to expand the depths of the variables that tend to play an important role as drivers to innovation in the public sector through careful analysis of the stakeholders in the two sectors of the economy in order to enable us to understand how innovation may be influenced or driven in the PSOs. In the case of public sector innovation, there is need to take into consideration the role played by these critical variables; political factors, social factors, technological factors, legal factors, economic factors, and environmental factors (PESTEL). These critical variables were not emphasised as very important in the three models under scrutiny, but they form part of public sector innovative capability, hence need to be integrated into a single model of public sector innovation.

This model is relevant to this study because it points to us the major drivers and barriers to innovation in the organisation. Innovation can only take place if all these drivers are strongly entrenched in the system that is if individual, groups and organisation management appreciate the importance of the organisational innovation.

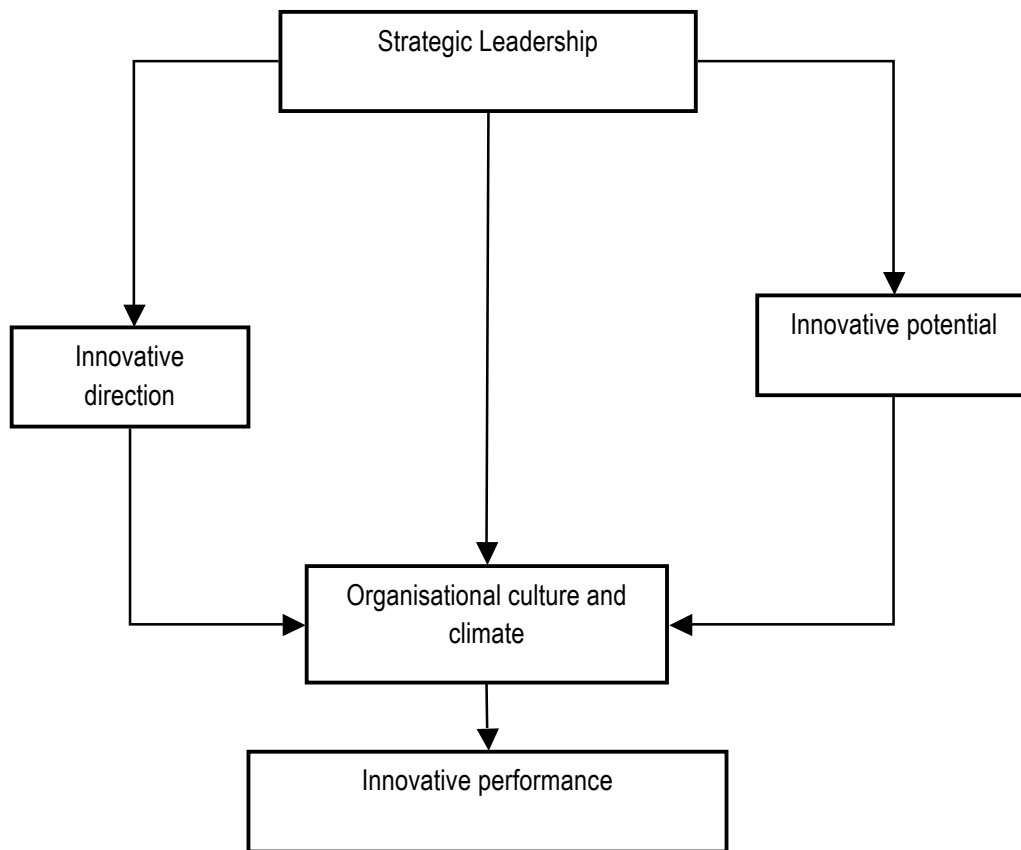
2.4 BASIC MODEL OF ORGANISATIONAL INNOVATION

The Basic model of organisational innovation (see Figure 2.3 below) developed by Nyström (1990:145) offers an interesting insight in the way innovation performance takes place in the organisation. First in this model, strategic leadership gives innovative direction and innovative potential that create organisational culture and climate for innovation to take place. The model highlights the importance of the role of strategic leadership in setting direction for an organisation's innovative performance (Loewenberger, Newton & Wick, 2014:191).

Strategic leadership has been associated the setting the pace in which radical changes take place in the organisation. At a strategic level, leadership sets the organisational vision, mission and purposefulness to guide the organisation's strategic innovative direction (Loewenberger, Newton & Wick, 2014:193; Spicker, 2012:44). This is because at the strategic level, creativity and innovation in an organisation are described in the vision and mission. It is further argued that strategic leadership can influence both what the organisation wants to do and what it can't do (Loewenberger, Newton & Wick, 2014:193).

Strategic leadership can further be divided into two sub-sets; innovative direction and innovative potential. Nyström (1945), and Nusair, Ababneh and Bae (2012) states that the strategic variable is innovative direction that determines the radical changes in what the organisation wants to achieve, while on the other hand, innovative potential demonstrates what the organisation can do given its structural constraints. This can take place by focusing on specific new technologies and markets the organisation can change its innovative direction, and by generating better resources that the organisation can harness to improve its innovative potential (Spicker, 2012:44). This in turn can help the organisation realise its possibilities for successful innovation.

Figure 2.4 Basic Model of organisational innovation



Source: (Nyström, 1990:145)

In the subsequent sub-section, the study discusses the Basic Model Organisational Innovation and its application in the context of the present research.

2.4.1 Discussion

The Basic Model of Organisational Innovation (Nyström, 1990:145) presents a good example and evidence of how innovation in any organisation can be studied. In the context of the present study of innovation in the Kenya's public sector organisations, the model offers the basis on what factors public sector organisations managers should take into consideration to foster successful innovation. Such factors put forward are strategic leadership, organisational culture and climate, innovation performance, innovation direction, and

innovation potential. Other studies have found that innovation fostered through strategic leadership, since strategic leadership is viewed as a focal reference for setting the organisational strategic direction, which is very crucial in steering the organisation in achieving strategic objectives. On one hand, scholars (Nusair, Ababneh & Bae, 2012:182; Zacher & Rosing, 2015:62) have suggested that leaders are an important factor and powerful source of influence on employees' innovative behaviour. These scholars went on to state that leadership in general is vital as a determinant of individual, team and organisational level innovation.

On the other hand, scholars (McMillan, 2010:12; Nusair, Ababneh & Bae, 2012) posit that leadership provides core competitive forces for effective leadership and innovation as the capacity to listen, skills and competencies, capacity to learn, and capacity to motivate followers as crucial for innovation performance. In addition, Nusair, Ababneh and Bae (2012:184) identify leadership dimensions that are important to innovative behaviour as having personal concern about employees' needs, and abilities; provide matching challenges and opportunities to learn in supportive environment; delegate authority as a way to developing them; give developmental feedback; and coach them.

Due to the role leaders play, they have an impact on the organisation's culture, climate and innovation. From the extant literature, scholars (Lin & Liu, 2012; McMillan, 2010; Nguyen & Mohamed; Sarros, Cooper & Santora, 2011; Zacher & Rosing, 2015:65) have identified many critical factors that define innovative behaviour and create organisational culture conducive to innovative practices, which reinforces the assumption made earlier by the Basic Model Organisational Innovation. In the context of the present study, Basic Model Organisational Innovation forms an integral part of innovation in Kenya's public sector organisations. The Model lends support to the assumption that strategic leadership in organisations has been found to be one of the drivers to innovation. Likewise, for example, other studies have pointed out that a lack of strategic leadership can hinder innovative capacity of the organisations.

Organisational leadership has been associated to the provision of culture that is supportive and flourishing for innovation (Lin & Liu, 2012:59). Norms, values, beliefs and assumptions held by organisational members are

shaped by the type and kind of leadership practices that are in place. Studies have shown that organisation culture and climate shape behaviour in one way or the other, depending on the members' perception of the prevailing culture and climate (Zacher & Rosing, 2015:65).

In sum, from the literature it is quite clear that leadership, be it strategic, transformational, or transactional has been confirmed to be associated with innovation. However, readers' must pay attention to the literature streams coming from the private sector, which highlights some leadership dimensions some of which are not easy to implement in the public sector as the two sectors differ in many ways. While there is evidence that leadership can be fostered in organisations through recruitment, selection and training, it would be imperative to impart such training that befits the nature of public sector organisations in order to have the right leadership in place that can steer organisations toward innovation path.

In the following sub-section, the study presents a critical analysis of organisation theory and evaluates its applications to the present study context.

2.5 ORGANISATIONAL THEORY

An organisation is a stable system of individuals who work together to achieve common goals through a hierarchy of ranks and division of labour (King, Felin & Whetten, 2010). Organisations are created to handle large-scale routine tasks through a pattern of regularised human relationships. Therefore, an organisation, as a social system, consists of various sub-units or divisions that make the "whole" which is referred to as "the organisation". On one hand, the "whole" can be explained as a totality and is not just the sum of its parts, but with more emphasis on hierarchical relationships within the system (Schneider & Somers, 2006:352). On the other hand, scholars (Child, 1985:4) for instance, define an organisation as the structure of an organised body, institution or enterprise. Based on the above definitions of an organisation, we find that innovation occurs in systems, and in order to understand innovation in the public sector, the whole system of institutional and organisational elements and processes must be studied (Pekkarinen, Hennala, Harmaakorpi & Tura, 2011:510). Child (1985:3) argues that the design of the organisation is one of management's major priorities.

This argument is based on the premise that the design of the organisation covers the basic framework of positions and relations to its sub-systems. Organisational theory helps managers to understand how tasks, resources and rewards are assigned the way they are in the organisational set up and the system of performance appraisal and management. Structural dimensions consist of the allocation of tasks and responsibilities to individual members of the organisation (Child, 1985:4), indicate the designation of formal relationships through hierarchy delegation of authority that is associated with the procedures, and create a design system to ensure effective communication of information and grouping of individuals into sections or departments.

2.5.1 Discussion

Organisational theory can be used to identify particular themes in an organisation in order to assist in helping find solutions to problems, maximising both organisational productivity and efficiency. Organisational theory is useful in this study since it can be applied to meet the requirement of the stakeholders in the organisation (Pekkarinen, Hennala, Harmaakorpi & Tura, 2011:510). In its application, the theory takes into consideration the processes undertaken by an individual, a group and the processes the organisation carries out as a whole. This is very relevant to the present study since innovation involves an individual, a group and organisation as a whole and how the work is arranged within the system structure. Since innovation takes place in an organisation, the study of organisational theory is very relevant for understanding how innovation takes place in the public sector organisations.

In the subsequent sub-section, the study explores the Systems theory and its applicability in the present study, looking merits and demerits in the context of Kenya's public sector organisations.

2.6 SYSTEMS THEORY

An organisation is a system, having an established structure and conscious planning, in which people work and deal with one another in a coordinated and cooperative manner for the accomplishment of recognised

goals (Cankar & Petkovšek, 2013:1; Rolfstam, Phillips & Bakker, 2011:454). On the other hand, organisation systems theory is defined as a complex organisation set of dynamically intertwined and interconnected elements including inputs, processes, outputs, feedback loops and the environment (Cankar & Petkovšek, 2013:1; Tigabu, Berkhout & Beukering, 2015:333). In the foregoing definitions, the systems theory considers the input-throughput-output component and their interactions both within themselves and with the external environments, the elements of purpose, people, structure, techniques and information that must be coordinated and integrated by the management in order to maximise value for the organisation (Daft, Murphy & Willmott, 2014:10; Fu & Xiong, 2011:213; Rolfstam, Phillips & Bakker, 2011:454). Amagoh (2008:4) posits that, in open systems, the goal of transformation is to improve horizontal and vertical fit of the subsystems with each other, and within the organisation. The organisation as a system consists of many interdependent parts and with many sub-systems that interact with each other to form a unified whole that gives the organisation its unique identity (Cankar & Petkovšek, 2013:1). The systems theory is characterised by free flow of communication and information, freedom to self-control, flexibility, and less emphasis on the enforced conformity to rules and regulations among the organisation members (Agolla & Van Lill, 2013:169). An organisation as open system must seek a fit between itself and the external environment within which it operates. For instance, an organisation may need key inputs from within or its external environment, and structural features in order to fit its employees within the tasks they face in particular organisational positions (Cankar & Petkovšek, 2013:1).

The systems concept views organisations as constantly interacting with their environment (Amagoh, 2008:1). Mason (2007:10) and Lee, Hwang and Choi (2012:159) further add that the organisational environment is comprised of a set of relationships between agents or stakeholders and other factors that may be beyond the control of the organisation. Open system theory refers to the concept that organisations are strongly influenced by their environment. Organisations are conceived in open systems as consumers of resources (i.e. inputs, such as raw materials) and exporters of resources (i.e. outputs, such as services) (Daft, Murphy & Willmott, 2014:22). For instance, King, Felin and Whetten (2010:293) state that the roles of an organisation

prescribe individual behaviour inasmuch as the individual acts within the domain of organisational activity. This is because open systems take inputs from the external environment that they transform into goods and services (Xu, Houssin, Caillaud & Gardoni, 2010:587). The environment consists of other organisations that exert various forces of an economic, political, or social nature (Lee, Hwang & Choi, 2012:149). In addition, the open systems approach views the organisations' interaction with the external environment as vital for organisational survival and success. The environment also provides key resources that sustain the organisation and lead to change and survival.

2.6.1 Discussion

Therefore, since the open systems theory considers the input-throughput-output component and their interactions both within themselves and with the external environment, it can be argued that PSOs are typical examples of an open system where there is continuous interaction amongst internal and external stakeholders with central objective, interdependence, and integration within the organisations (Daft, Murphy & Willmott, 2014:22; King, Felin & Whetten, 2010:295). PSOs are made up of people in different departments that are governed by policies and procedures that have developed over time (King, Felin & Whetten, 2010:295). Therefore, systems theory can be useful in policy-making within the PSOs, since it can be used as a mechanism to enhance understanding when public policy is made and to generate concepts, ideas and modes of action when policy makers need to make recommendations about policy problems (Amagoh, 2008:9; Stewart & Ayres, 2001:84).

The open system implies that employees share a sense of commitment to goals; authority and power are delegated and dispersed across the entire organisation. The open system is less autocratic and bureaucratic than complexity theories (Abouzeedan & Hedner, 2012:17; Amagoh, 2008). The open systems theory is very much relevant to this study as it lends support to the innovation theory in that this system is more flat and flexible, which allows for faster decision-making (Abouzeedan & Hedner, 2012:13). The open system is also organised in work groups that reflect diversity of skills, education, training, thoughts, and experience, which

act as drivers to innovation. In open systems organisation, communication flows freely among the organisational members (Amagoh, 2008). In this theory, leaders can support innovation through encouragement of information sharing and collaboration and minimising politics within the organisation (Hilgers & Ihl, 2010:74). Hence, open system theory is applicable to this study as it informs us on how the employees interact within the organisation and the environment.

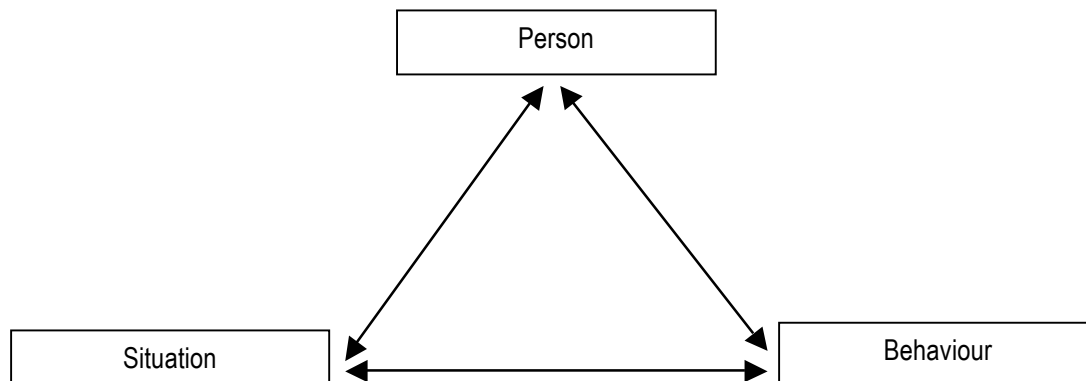
Kanter (1988), for example, advocates the use of open system theory in the study of innovation in organisations. Kanter (1988), and Hilgers & Ihl (2010:74) outline a theory in four steps to first describe idea innovation, second is coalition building (i.e. colleagues are persuaded to support ideas), the third is the realisation of ideas and the fourth is the transfer or dissemination. In brief, systems theory views organisation as a system that is more receptive to new ideas and more flexible in processing information, and therefore more likely to recognise the potential of a radical innovation (Valencia, Valle & Jiménez, 2010:467). The social structure of the system affects the innovation's diffusion in several ways. This is because a social system constitutes a boundary within which public sector (PSOs) innovation diffuses.

In the following sub-section, the study critically appraises the social learning theory and how it can be applicable to Kenya's public sector organisations as demonstrated below.

2.7 SOCIAL LEARNING THEORY

Social learning theory developed by Albert Bandura (1977) proposes that a person's behaviour is determinist, in that as an individual continuously interacts with the environment, the person's behaviour is modified, so is the situation itself. Bandura and his associates carried out an experiment, in which children observed and subsequently imitated the behaviour of adults (a model). The social learning theory is based on the idea that, human beings learn from interactions with others in a social context. This usually occurs through observing the behaviours of others resulting in the development of similar behaviours (Rodríguez & Guzmán, 2013:995; Salleh, Chong, Ahmad & Ikhsan, 2013). According to Bandura this interaction between the individual, situation and other behaviours results in reciprocal determinism as shown in Figure 2.4.

Figure 2.5 Social Learning Theory



Source: (Bandura, 1977)

Bandura argues that behaviour; the environment (situation) and the individual operate as interacting determinants that have a bidirectional influence on each other as in Figure 2.4. Social learning theory proposes that, as man interacts with others, new patterns of behaviour can be acquired through direct experience or by observing the behaviour of others (Rodríguez & Guzmán, 2013:995; Windrun, 2014:1053). On the other hand, environmental (situational) events in the form of modelling, instruction, and social persuasion affect the person, and in turn the person evokes different reactions from the environment (situation) depending on his or her personality and physical features (Salleh, Chong, Ahmad & Ikhsan, 2013:427). Thus finally, behaviour determines aspects (such as activities, products, or services) that can or do interact with the environment (situation) to which the individual is exposed and the behaviour in turn is modified by that environment (Salleh, Chong, Ahmad & Ikhsan, 2013:427).

Social learning theory posits that employee behaviour in the organisation is a result of reinforcement contingencies on the behaviour of the employee within organisations (Hasu, Honkaniemi, Saari, Mattelmäki & Koponen, 2014:319). Similarly, a reinforcement contingency refers to the environmental cues that precede employee behaviour (discriminative stimuli) and to the rewards that subsequently reinforce employee behaviour (Rodríguez & Guzmán, 2013:995). Within the framework of social learning theory, reinforcement

primarily serves informative and incentive functions, although it also has response strengthening capabilities (Johannessen, 2013:1199). This is because, during the course of learning, people not only perform responses, but they also observe the differential consequences accompanying their various actions. On the basis of this informative feedback, they develop thoughts or hypotheses about the types of behaviour most likely to succeed (Windrun, 2014:1047; Johannessen & Skaalsvik, 2015:97). Accurate hypotheses give rise to successful performances, whereas erroneous ones lead to ineffective courses of action. In this case, cognitive events are thus selectively strengthened or rejected by the differential consequences accompanying the more distally occurring overt behaviour. The social learning theory posits that learning by experience, and reinforcing consequences partly serve as an unarticulated way of informing performers about what they must do in order to gain beneficial outcomes or to avoid punishing one (Johannessen, 2013:1199).

2.7.1 Discussion

Bandura, for example, argues that although behaviour can be shaped into new patterns to some extent by rewarding and punishing consequences, learning would be laborious and hazardous if it proceeded solely on this basis (Johannessen, 2013:1199). Social learning theory argues that environments are loaded with potentially lethal consequences that befall those who are unfortunate to perform dangerous errors (Windrun, 2014:1047; Johannessen & Skaalsvik, 2015:97). For example, it will be ill advised to rely on differential reinforcement of trial-and-error performances. Most of the behaviours that employees display are learned, either deliberately or inadvertently, through the influence of example. There are several reasons why modelling influences figure prominently in human learning in everyday life. When mistakes are costly or dangerous, new modes of response can be developed without needless errors by providing competent models that demonstrate how the required activities should be performed (Johannessen, 2013:1199).

Although the theory is based on a study conducted on children, social learning theory is very relevant for the study of innovation. Like the children, adults (employees) too can learn by observing, watching, or imitating fellow employees at work (Albury, 2011:232; Hayes, Hodges, Scott, Horn & Williams, 2007). Hayes *et al.*

(2007), during one part of an experiment where both children and adults were to imitate a video model of a movement, found that adults in the study performed more accurately than the children, in general. According to social learning theory, behaviour is learned, at least in rough form, before it is performed (Spicker, 2012:42). By observing a model of the desired behaviour, an individual forms an idea of how response components must be combined and temporarily sequenced to produce new behavioural configurations (Johannessen, 2013:1199). In fact, Spicker (2012:42) states that people's training, their experience and the conditions they work in condition their behaviours.

In the context of the Kenyan PSOs, the current theory (social learning theory) offers a practical typical example of how organisations can use their capabilities through adoption of various techniques to foster creative learning among the employees. Kenya's PSOs are social organisations and interact with their environment (Government, technologies, customers, research institutions, private sector), which in turn have profound influence on their internal operations. Alternatively, Kenya's PSOs actions could impact positively or negatively on the external environment through their services, products or processes that they produce or use. This is because organisations are no longer operating as closed systems, but rather open systems (Kallio & Lappalainen, 2015:141; Lee, Hwang & Choi, 2012:148). Currently, PSOs are required to focus on the use of outside-in and inside-out processes by working with complementary partners through alliances, cooperation, and joint ventures in order to innovate (see, Johannessen, 2013:1196). This type of arrangement is not exceptional to Kenya's PSOs (Lee, Hwang & Choi, 2012:148). Therefore, these social interactions with others in a social context could develop into new social behaviours, which can trigger innovative outcomes. For example, a SWOT analysis on the surveyed organisations in chapter 1 revealed a number of areas that require collaborative efforts to solve, such as a high prevalence of HIV / AIDS among the locals, low funding, and environmental degradation. In addition, the SWOT analysis in chapter 1 also indicated areas with opportunities for Kenya's PSOs such as public private sector partnership policy and support from development partners that are very critical in innovative ventures.

Organisations are social entities just like human beings and are capable of reinventing themselves. Therefore, there is a need for Kenya's PSOs to take cues from the external environment, particularly the customers and suppliers. Studies reveal that customers and suppliers stimulate innovation based on the demand and supply side of the PSOs (see, Reynoso, Kandampully, Fan & Paulose, 2015:170; Windrun, 2014). Alternatively, society may also place demand for public services that require the PSOs to adopt new ways of delivery of such services with improved value to the citizens. For example, the SWOT analysis revealed that PSOs have weak IT infrastructure, which may force PSOs to place demands on the supplier of IT services to supply state of the art IT infrastructure to revamp its weak IT infrastructure. This could lead to the adoption of new technology that can revolutionise the IT unit within such organisations (Lee, Hwang & Choi, 2012:149). This is a typical example of the PSOs interaction with its environment.

Kenya's PSOs also can learn from their private sector counterparts through imitation or adoption of appropriate technologies or methods that might have social and economic values, since the private sector is always known to be the first adopters or source of new technologies (Lee, Hwang & Choi, 2012:149). Through the social interactions between the two sectors and integration of better methods and processes learnt from such interactions, PSOs can offer improved services and goods to the citizens. This is because innovation in the context of public sector organisations has little value unless it benefits customers (Lee, Hwang & Choi, 2012:149; Reynoso *et al.*, 2015:157). The argument being advanced here is that this type of interaction changes the organisations situation (environment), behaviour (organisation) and the person (employee), which creates a bidirectional influence on each other. Similarly, other scholars (Lee, Hwang & Choi, 2012:149) argue that public sector innovation should focus more on a continuous process of interaction and negotiation among various stakeholders. Furthermore, a number of public sector organisations have been reaching out for good ideas from across the world for new ways to deliver public services (Albury, 2011:230; Reynoso, Kandampully, Fan & Paulose, 2015:170). This is not an exception for Kenya's PSOs. The point here is that such interactions are aimed at using external knowledge sources in order to add public value.

Therefore, the present study borrows from social learning theory in studying innovation in Kenya's public sector organisations, as it lends support to the understanding of the dynamics within public sector interactions with the environment. Kenya's public sector organisations can learn a lot from the social learning theory by opening their boundaries for new ideas from the external environment through citizens' participation, alliances and joint ventures. This kind of interaction will increase their learning, information and knowledge exchange capabilities between the organisation members and environment.

2.8 SYNTHESIS

Synthesis refers to all the elements that constitute building up separate elements into a connected whole or theory (Slavich, 2010:38). Innovation has been conceptualised differently by many scholars (Jack, Anderson & Niamh, 2013:272; Valencia, Valle & Jiménez, 2010:467). This is because innovation occurs in complex, ill-defined problems that include activities such as generation of new ideas, idea maturity, and implementation (Mumford, Scott, Gaddis, & Strange, 2002; Reynoso, Kandampully, Fan & Paulose, 2015:158). Innovation involves a multi-stage process coupled with different activities and different individual actions at each stage; it starts with problem identification or recognition, and generation of ideas; then building a consensus among different stakeholders for it; with the last stage completing the idea by producing a prototype or model (Scott & Bruce, 1994). From the foregoing description of innovation, it is evident that innovation involves a process and each process requires different sets of behaviours from the organisation members in order to bring about novelty or remarkable change.

Lee, Olson and Trimi (2012:818) state that innovation is a very broad concept, and can mean scientific inventions, patents, technological breakthroughs, or even a simple new way to do things. This involves using knowledge to find new ways to create and bring about change for the better. This definition has implications for the types of activities within businesses that can be considered innovative. It also views innovation differently to invention, and posits that innovation may not require creation of new knowledge. What it does require is the inspired application of knowledge (old or new) to create additional value (Johannessen,

2013:1205). In essence, this offers a good definition, but falls short of giving a working definition for the purpose of the present study. However, Amabile *et al.*'s (1988:1155) definition of innovation as the generation of new ideas, production of novel, useful, original ideas by an individual or a group of individuals working together seems to fit well with the study objectives and purpose. This definition views innovation as new ideas, technology, products, processes, services and whether they are newly introduced to the world, organisation or a country.

Green, Howells and Miles (2001:9) and Johannessen (2013:1205) seem to share their understanding with Amabile (1988) on the definition of innovation. They define innovation as, “doing something new or introducing a new practice or process, creating a new product (good or service), or adopting a new pattern of intra- or inter-organisational relationships (including the delivery of goods and services)”. From the definition of Green, Howells and Miles (2001:9), it is clear that innovation is not merely a change, but rather seeks for novelty in doing things. On-going change is a common feature within most business organisations, however this can only be described as innovation where particular qualities are displayed. For instance, the recruitment of new employees / workers constitutes ‘change’ but is an innovative step only where such employees / workers are introduced in order to import new knowledge or carry out novel tasks (Green, Howells & Miles, 2001). In the context of Kenya’s public sector, innovation needs to be defined to fit the nature and complexity of the public sector as opposed to the private sector. The rationale is that a lack of clear definition of innovation as applied to the public sector may only lead to more confusion, hence the need to come up with a more precise definition. It is noteworthy to examine other definitions of innovation that have been put forward or thought to be inclusive as far as innovation is concerned.

Johannessen (2013:1205) furthermore adds that innovation can be understood as either technological or organisational in nature. Although researchers have long focused on the technological, organisational innovation is evident and important in the operation and activities of both manufacturing and service organisations. It should be noted that innovation too can be unsuccessful, many products fail in the marketplace, when they do not meet users’ requirements or fail to meet them as well as competitor’s

offerings. Innovation will be the result of explicit innovative efforts of which the most obvious is R&D (Research and Development). However, innovative efforts extend well beyond this and include, for example, the acquisition of new generations of technologies, the training of staff, and preparation of the clients and markets for the introduction of new products or services.

OECD / EC/Eurostat (2005; 2005a) give the definition of innovation as:

“Implementation of a new or significantly improved (product or service), or process, a new marketing method, or a new organisational method in business practices, workplace organisation or external”.

The main argument here was to give innovation a wider definition that would include product and service as opposed to technological to make the concept more applicable to firms with less Research and Development (R&D) particularly in the service sector. Therefore it is suggested that innovation should involve: *product innovation, process innovation, market innovation, and organisational innovation*. Therefore, for the present study, innovation in the public sector is conceptualised and defined as:

“Creation, application of, or introduction of new products, services, processes with the aim to add public value to the citizens or commercialisation.”

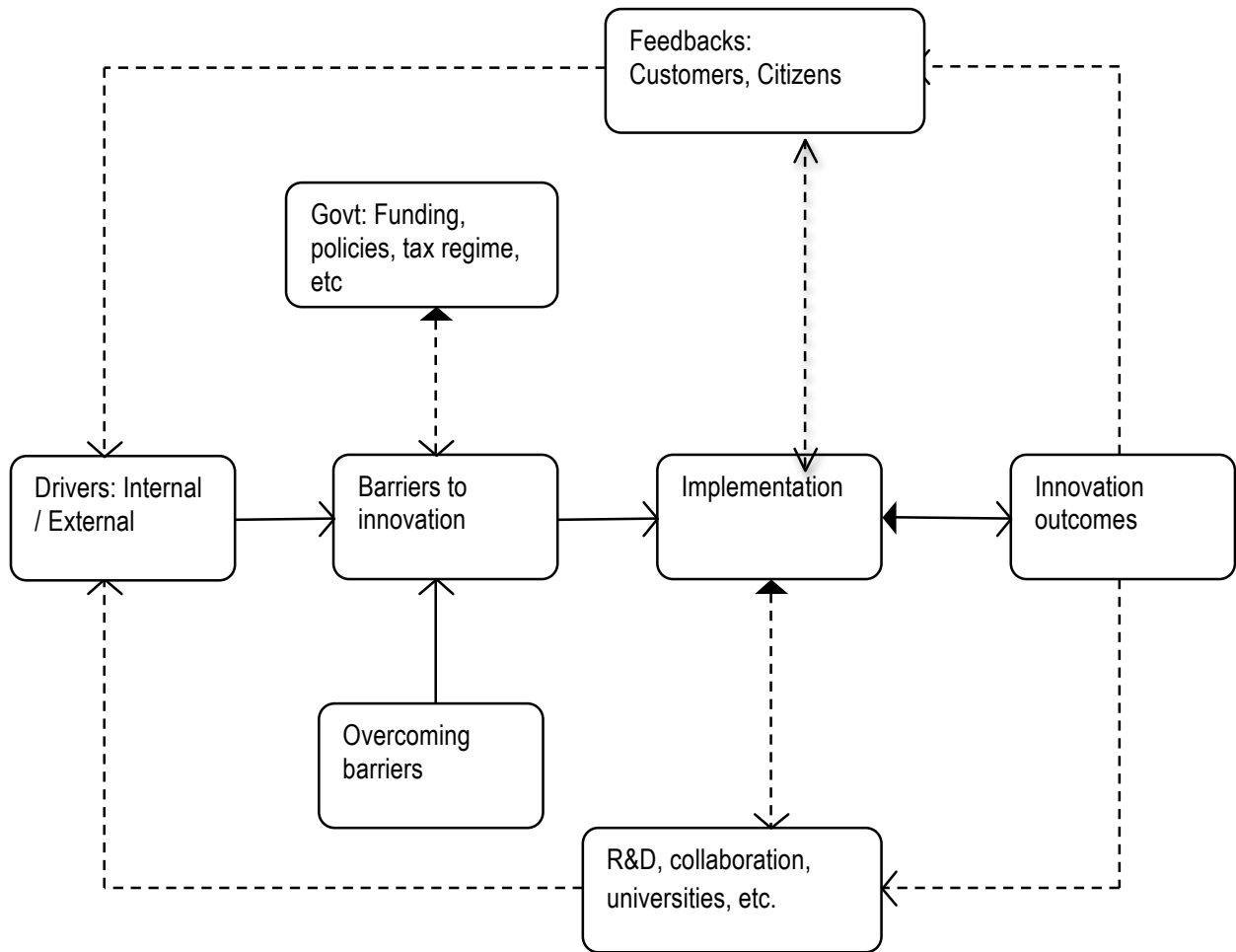
In the following sub-sections, the study develops a conceptual framework based on the study objectives, relevant literature, theoretical foundations and organisation theories.

2.9 CONCEPTUAL FRAMEWORK

The conceptual framework presented in Figure 2.5 summarises the factors that determine how organisations can be innovative in their operations. Innovation never begins at an entry point of the individual into the organisation and therefore this theory tries to integrate innovation as a single theory for PSOs innovation. Drawing on Andriopoulos (2001), Nyström (1990) and Amabile *et al.* (1996) models of innovation, the present study presents a synthesis of organisational innovation as indicated in the conceptual framework in

Figure 2.5. These elements and others are discussed later in Chapter 3 in order to give a clear picture on how they help to develop a theory for public sector innovation.

Figure 2.6 Conceptual framework of the study



Source: (Agolla, 2014)

These barriers are seen to be intervening between the drivers and innovation activities, which ultimately have a negative impact on the overall organisation innovation. In the study model, a link was first developed indicating direct and mediating variables for the relationship between the drivers, barriers, innovation

activities, strategies to overcome barriers and innovation outcomes. Innovation barriers intervene between innovation drivers, which affect the rate of innovation activities resulting in high or low innovation outcomes.

In the following sub-section, the present study presents the hypothesised structural model based on the theory that will be tested.

2.10 STRUCTURAL MODEL OF THE STUDY

The present study attempts to develop a theoretical model of the public sector innovation that will be empirically tested. The study draws from empirical studies and research concepts and theories related to innovation to propose a conceptual structural model as shown in Figure 2.6 below.

Internal factors (internal drivers)

Previous studies (Azis & Osada, 2010:175; Cankar & Petkovšek, 2013:2; Dumay, Rooney & Marini, 2013:622) have identified internal factors (internal drivers) to innovation in the public sector organisations as “strategy, organisation climate, strategic leadership/transformational leadership, intrapreneurship, organisational resources, technology, customer relationships/loyalty, supplier relationships, and good management practices”. Whereas these studies confirmed positive relationships between internal drivers and innovation indicators/outcomes, it should be noted that most of these empirical studies were done in the private sector whose characteristics and management differ substantially in comparison to the public sector. Therefore, the limited literature on innovation in the public sector showed that there is a need to investigate the relationship between internal drivers and innovation indicators/outcomes. Thus the following two hypotheses were suggested:

H1- Internal factors are statistically significantly directly positively related to innovation indicators.

H2- Internal factors are not statistically significantly related to innovation indicators mediated by barriers.

Overcoming barriers

Organisations face obstacles that prevent innovation from taking place. Several studies have identified barriers and strategies to overcome such barriers to innovation in the public sector. For example, studies by Fu & Xiong, 2011:204; Hu, Gu & Chen, 2013:162; Spicker, 2012:37 confirmed a positive relationship between strategies to overcome barriers to innovation indicators/outcomes innovation mediated by barriers as availability material resources, appropriate innovation policy, transformational leadership, learning organisation, training and appropriate reward systems. Given limited literature on innovation in the public sector, and the mainstreaming of vast literature from private sector, the current study found it relevant and necessary to investigate the relationship between overcoming barriers to innovation indicators/outcomes mediated by barriers. Thus, the present study posited that:

H3- Overcoming barriers are positively related to innovation indicators mediated by barriers.

External factors (external drivers)

Studies (Ghazinoory, Bitaab & Lohrasbi, 2014:465) have shown that innovation in the public sector organisations is externally driven. The external factors (drivers) are political, economic, social, technological and legal (Cankar & Petkovšek, 2013:3; Ozer, Demirkan & Gokalp, 2013:300). The premise is that the public sector, as an open organisation, takes inputs (resources) from the external environment and transforms them into outputs (goods/services). In the absence of these inputs, innovation in the public sector organisations cannot be achieved. Studies (Khilji, Mroczkowski & Assudani, 2012:266) have found no significant relationship between external factors and innovation indicators/outcomes mediated by barriers. On one hand, Sun, Shih, Hsu & Chen (2013:369) confirmed the relationships between external environment factors namely social, economic, demographic and geographical as key players in the pursuit for innovation, while on the other hand, studies, for example by Ghazinoory, Bitaab & Lohrasbi, (2014:465) have shown that external factors are statistically significantly directly related to innovation indicators/outcomes. Therefore, the present study developed two hypotheses as follows:

H4- External factors are not statistically significantly directly related to innovation indicators mediated by innovation barriers.

H5- External factors are statistically significantly directly related to innovation indicators.

Barriers to innovation

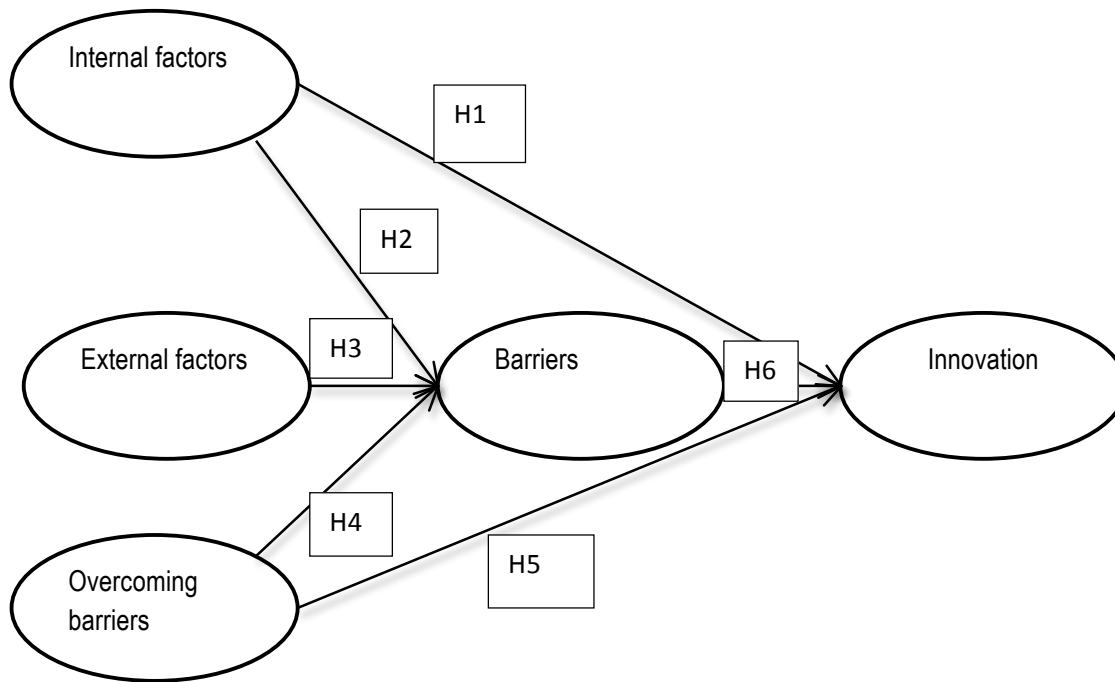
Studies have shown that innovation in the public sector is hindered by numerous factors such as absence of clear innovation policy, inadequate rewards systems, over-reliance on the exploitation of existing resources, bureaucracy, high risks in projects and a culture of risk aversion amongst the public sector managers (Manzini, 2012:7; Mulgan & Albury, 2003; Stewart, 2014:241; Sabir & Sabir, 2010:220). These studies suggest that innovation will not take in the public sector if barriers are persistent. In other studies (Stewart, 2014:248;) barriers to innovation indicators/outcomes were found to have a statistically significantly negative or not significantly positive relationship between barriers to innovation indicators/outcomes. Given the limited empirical literature on the public sector, the application of private sector literature, and a non-tested link between some variables in prior studies, the present study posited the hypothesis as thus:

H6- Barriers are statistically significantly negatively directly related to innovation indicators.

The proposed structural model in Figure 2.6 was developed based on the review of the relevant literature on innovation. The study breaks down drivers into: internal drivers (organisation strategy, leadership, organisational structure, organisational resources, learning organisation), and external drivers (government, legal, environment, political, economic, social and technological). The proposed structural model of the present study clearly describes the sequence of flow (arrows direction) of the constructs by indicating the causes and effects related to drivers and innovation indicators within the public sector. The critical factors or latent variables of this structural model are grouped under the following headings; internal drivers/factors, external drivers/factors, barriers, overcoming barriers and innovation outcomes. The argument advanced in

this structural model is that innovation outcomes are a function of both drivers mediated by barriers and overcoming barriers.

Figure 2.7 Hypothesised structural model of the study



In the next sub-section, the significance of the present study to both theory and practice are presented.

2.11 SIGNIFICANCE OF THE STUDY

The expected contribution of this study are: First and foremost, this work seeks to extend the literature on public sector organisations innovation by carefully analysing, and critically reviewing related literature on innovation practices in the public sector. This will significantly contribute to the theory and existing body of knowledge on innovation in the public sector organisations.

Secondly, the experience of Kenya’s public sector innovation can also be transferred to other regions that can inform their decisions with regard to assessment of innovation in the public sector.

Thirdly, this work will also contribute to policy development through the recommendation of relevant policies that can be applicable to public sector organisations in Kenya. This will help the policy makers to come up with various strategies to promote public sector innovation. In addition, the policy makers will put in place various interventions to remove barriers to public sector innovation.

Fourthly, this research would be of immense benefit to the Ministry of Regional Development Authorities, and the individual employees of the selected public sector organisations.

Fifthly, apart from filling identified gaps, this study intends to develop a theory /framework for assessing innovation in the public sector organisations which can be applied to Kenya's situation and other developing countries.

Finally this study has implications for both theory and practice for future researchers interested in public sector innovation.

2.12 SUMMARY

This chapter discussed the theoretical and conceptual framework, which informed the study. The models discussed here include creativity model determinant, a model of innovation, organisation, and systems theories, and social learning theory. Three models informed the present study, and the three theories as discussed in Chapter 2. The rationale for the choice of these models over others in the context of the present study is that; first, these models and theories lay groundwork upon which the study of innovation is based. Second, they form the basis under, which a comprehensive framework can be developed to assess innovation in public sector organisations. On the one hand, these models have been found to be robust and have been replicated earlier by most scholars studying innovation. On the other hand, the systems theory has been found applicable in this study, as it lends support to the innovation activities in modern organisations that continually seek to renew their operations as a result of the environmental influences and effects. In the

subsequent chapter, the study reviews the literature based on the background, research objectives, research questions, hypotheses, and theoretical and conceptual framework of the present study.

CHAPTER 3 LITERATURE REVIEW

3.1 INTRODUCTION

The focus of this research was to develop a model that could be used to assess innovation in public sector organisations. In this chapter, the study critically reviews the literature on drivers, barriers, overcoming barriers, and innovation outcomes. To achieve the purpose of the present study, the chapter starts with an overview of innovation, global perspective of innovation, nature of innovation, challenges of innovation, drivers, barriers, innovation outcomes, and strategies to overcome barriers. These components / elements will be discussed in the subsequent paragraphs.

3.2 INNOVATION

Innovation has been recognised as an important driver to economic growth. Most empirical research and surveys of organisations show that innovation leads to new products and services that are higher in quality and lower in price (Johannessen, 2013:1205; Simon & Yaya, 2012:1040). To be competitive in the global market, organisations must continuously develop innovative and high-quality products and services, and deliver them on time and at a lower cost than their counterparts (Johannessen, 2013:1205; Stark, 2011). Therefore, today's employees are required to be creative, yet also conform to rules and standards, and work efficiently to meet time and budget constraints (Agolla & Van Lill, 2013:168). Globally, many of the world's nations are now involved in major efforts aimed at reforming and improving their governments (Agolla & Van Lill, 2013:172; Petkovšek & Cankar, 2013:1331). As such, innovation is seen to be the panacea to better service delivery through which public goods can meet the diverse needs of the population (Albury, 2011:227; Hurmelinna-Laukkanen, 2011:313; Simon & Yaya, 2012:1040).

Innovation is defined as the “creation, application of new, or introduction of new products, new services, new processes with the aim of commercialisation in order to add economic value to the organisation” (Amabile *et al.*, 1988; Jack, Anderson & Connolly, 2014:272; Saunila & Ukko, 2012:355). Therefore, innovation is

linked to skills, as the level of skills available will naturally affect the ability of the organisations to innovate and take advantage of technology transfer and adoption (Jack, Anderson & Connolly, 2014:272). The argument here is that higher levels of skills improve productivity as workers can adopt new technologies, techniques and processes at a faster rate. It is these new products, services or new processes that organisations need to turn into viable commercial products or services in order to remain competitive in these globalised markets. Therefore, innovation is a creative idea or act of conceiving and implementing a new way of achieving a result and / or performing work and has traditionally been associated with the private sector, since effective innovation equates to organisational and commercial growth and even emergence of new industries (Johannessen, 2013:1207). The concept of innovation in the public sector is combined with the overall definition of innovation and with individual types of innovation in the public sector that take into account the fact that it must be implemented and that it brings significant changes compared to existing practices. Therefore, innovation comprises new or significant changes to services and goods (Petkovšek & Cankar, 2013:1331). In addition, Saunila and Ukko (2013:991), and Simon and Yaya (2012:1026) observe that increased profit and survival in a competitive global economy have been powerful incentives for the private sector to innovate. On the other hand, government innovation refers to new products, new policies and programmes, new approaches, processes and methods of delivery that result in significant improvements in efficiency, effectiveness and/or quality of outcomes. Truly, faced with increasing demand from the general public, much attention has shifted to innovation in the public sector to address the problems affecting citizens (Serrano-Bedia, López-Fernández & García-Piqueres, 2012:557). This is because innovation is crucial for competitiveness; organisations, companies and countries must innovate to remain competitive.

Competition is at the core of the success or failure of PSOs. The reason is that competition determines the appropriateness of organisational activities that can contribute to its performance. For example, when market structures change, many new opportunities emerge, and creative destruction cleans up and clears the field for innovation and entrepreneurs in the industries that are affected (Johannessen, 2013:1209). However, this is not a common phenomenon in the public sector, since competition is limited by the very nature of the

legislative framework that created PSOs. Hence, there is a need to create competition that can stimulate innovation among the players within the sector. For example, competitive funding can be provided to PSOs based on their innovative approaches to solving societal problems. Increasing global competition, coupled with rapidly changing technology and the shortening of the product life cycle, has made organisations more vulnerable to failure than before. Therefore, to overcome potential failures, it is crucial for the organisations, whether private, public or non-government, to innovate (Lee, Hwang & Choi, 2012: 148). Similarly, other studies (Sun *et al.*, 2013:361; Valencia, Valle & Jiménez, 2010:466) further point out that post-industrial organisations today are knowledge-based organisations and their success and survival depend on creativity, innovation, discovery and inventiveness. The ability to develop viable products and services is important to all organisations including PSOs. Product or service innovation enable PSOs to improve the quality of their output, revitalize mature businesses, enter new markets, react to competitive encroachment and try out new technologies, leverage investment in technologies that are so expensive that no single product or service can recoup them, and develop alternative applications for existing product or service categories (Hilgers & Ihl, 2010:75).

However, assessing innovation in the context of the public sector is still inadequately addressed (Clark, Good & Simmonds, 2008; Oyelaran-Oyeyinka & Sampath, 2007). Studies such as Jack, Anderson & Connolly, (2013:272); Petkovšek & Cankar, (2103:2); Reynoso, Kandampully, Fan & Paulose,(2015:158) point out that innovation process is influenced by different factors. The factors that stimulate innovation activities are considered to come from the external environment and from the organisation itself (internal). Similarly, scholars (Serrano-Bedia, López-Fernández & García-Piqueres, 2012:557) have identified two critical drivers for innovation: internal and external. Researchers like Petkovšek and Cankar (2013:1), Erakovich and Anderson (2013:166), and Russo-Spena and Mele (2012:528) identified collaboration, networking, research and development as some of the key drivers to innovation in the public sector organisations.

However, it is worthwhile to take stock of global innovation perspectives before the study focus on the specific drivers, barriers, overcoming barriers and innovation outcomes. Such a look at global innovation will

enable us to establish why some parts of the world are more innovative than others, hence providing a global perspective of innovation.

3.2.1 Global perspective of innovation

In the preceding sections, the study focused on innovation in general and the definition given by notable scholars. However, in this section the focus is on the global perspective of innovation, and how it affects the global outlook. Most of the developed economies of the West and East Asia have long made innovation their way of life as compared to the least developed economies, particularly in Africa (Reynoso, Kandampully, Fan & Paulose, 2015:157). USA, UK, Japan, France, Germany, The Netherlands, Canada, and Sweden are among the first developed nations that consistently enacted industrial policies, which took into consideration the concept of National Innovation System (NIS) that replaced the more general industrial policies of earlier years after the Second World War (Conteh, 2012:465; Goh, 2005:221). One view of a National Innovation System (NIS) sees the individual enterprise as the core supported by science and technology infrastructure with a variety of technology transfer activities linking the two (Bartels, Voss, Bachtrog & Lederer, 2012).

Balzat and Hanusch (2003:196) describe a National Innovation System (NIS) as, “a historically grown subsystem of the national economy in which various PSOs and private sector organisations interact with and influence one another in the carrying out of innovative activity”. In the Far East, where rapid economic growth has moved fast, the growth of the Asian tigers -Hong Kong, Singapore, South Korea and Taiwan- is attributed to well-articulated government industrial policies that were executed effectively (Pack and Westphal, 1986; Rodrick, 1995). Goh (2003) and Legge (1993) have pointed out that past solutions of industrial developments have centred primarily on government’s fiscal incentives or subsidies alone to improve the cost of production and factors of efficiency in the creation of goods and services that have become less effective.

In Australia, for instance, there is enthusiasm for supporting innovation at all levels of government (Hyland and Beckett, 2005:337), while in the USA, there is the tendency to let employees feel different in terms of

thoughts and ideas. It is this flow of ideas between different actors and access to knowledge that are important components of innovation in the organisations (Petkovšek & Cankar, 2013:2). A number of studies (Kallio, Kallio & Bloomer, 2015:393; Sarros, Cooper & Santora, 2011:294) reveal that the USA government plays a role in funding research and investing directly in innovation in certain areas such as defence technology and space exploration. These scholars further point out that American culture, society, economic and legal institutions are specifically conducive to innovation. The individualistic culture that is typical of the USA has been found to be the driver of innovation in the USA. However, researchers are not unanimous on the issue of individualistic culture as the driver of innovation (Choi & Park, 2014:957). Sarros, Cooper and Santora (2011:295) further opine that cultural barriers may be easily overcome when economics and PSOs favour change.

Developed countries see innovation as an ingredient to help raise them up in the value chain and give them an edge in the expanding global marketplace, what Harvard business guru, Michael Porter, calls a “competitive advantage” (Porter, 2001; OECD, 2005a). Attractive policy ideas, unlike natural comparative advantages, imply that innovation can be cultivated and improved. This is because innovation transforms an idea into a new, improved product, process or service (Suwannathat, Decharin & Somboonsavatdee, 2015:538). This characteristic also applies to developing countries, which can harness innovation as a springboard for faster progress. The question is how to foster innovation successfully? In order to harness innovation, developing economies need to invest more in areas that improve knowledge in society such as Research and Development and sciences. This should also include well-designed school curricula, which allow for technological integration and cater for the needs of society. The school curriculum should be designed to solve societal problems rather than just to fulfil the requirements of the education system. For example, the United States government always puts a lot of emphasis on the education system to focus more on science subjects such as Mathematics, Physics, Chemistry, and Biology as the basis for a strong innovative society. The argument here is that it is these subjects that will make the country more competitive in innovation areas, with the aim to solve the current and future problems affecting our society. On the contrary, in developing

economies, most governments do not have enough funds for schools to enable the schools to buy the basics of the science subjects such as laboratories. To understand the discourse on innovation, the study investigates the nature of innovation, as it often understood through the scholars' ideas in the next section.

3.2.2 Nature of innovation

In the previous section, the study reviewed the literature on the global perspective of innovation and how innovation has enabled other regions such as USA, Sweden, France, UK among others to excel to the level where they are today.. The nature of creativity is defiant; and this is because creativity does not follow rules or procedures. It comes from diverse and sometimes even weird ideas. Huang, Chen and Yu (2011:10) point out that innovation involves something new, that changes the status quo and is disruptive. In addition, scholars (Petkovšek & Cankar, 2013:1331; Russo-Spena & Mele, 2012:539) argue that creativity, which is the precursor to innovation, always comes from unexpected sources, rather than from well-structured or obvious sources. This is why creativity and social consensus are thought to make uncomfortable bedfellows. This expression implies that creativity changes things, especially traditional ways of thinking, as members of an organisation accept new ideas. The result of this is collective creativity that is perceived in current discourse as a commercial opportunity derived from designing the collective framework successfully (Russo-Spena & Mele, 2012:539). Pech (2001:559) points out that creative thinking leads to changes and if those changes provide social or economic benefits, the result becomes an innovation. Creativity has always existed in many western and Far Eastern PSOs, and has made these countries to be leaders in both superior products and services. Many scholars (Russo-Spena & Mele, 2012:547) opine that creativity is not an inherent quality of a person, process, product or place, but rather a domain-specific social construction that is legitimised by judges who serve as gatekeepers to a particular domain. Martins and Terblanche (2003), and Suwannathat, Decharin and Somboonsavatdee (2015:530) looking specifically at factors that stimulate innovation, suggest five factors: strategy, structure, support mechanisms, behaviour and communication.

Competitors have driven both employees and PSOs to continuously search for new ideas, new processes of work, products and services, and new strategies in order to adapt, survive and grow in the rapidly changing business environment (Laforet, 2011:395). The concept of innovation has a long history and different meanings (Laforet, 2011:395), mainly based on competition between organisations and the different strategies that can be used to compete (Azis & Osada, 2010:173; Laforet, 2011:400). Ribiere and Tuggle (2010) further state that innovation covers the whole PSO – from the first ideas right through to the introduction of a product or service into the market. Innovation is at the bottom line, based on the firm's ability to manage creativity. Given the challenges faced by today's PSOs, the relevance of creativity to problem solving, decision-making, and research and development (R&D) is clear (Lopez & Esteves, 2011:90). Similarly, Huang (2012:125) argue that innovation is more than technical-organisational; innovation also demands a social policy. Pekkarinen, Hennala, Harmaakaorpi and Tura (2011:512), for example, state that in the context of the public sector, there is also much discussion on social innovation, but it should be noted that the concept of social innovation is far from clear and has a variety of definitions. Pekkarinen *et al.* (2011:512) and Johannessen (2013:1200) broadly define social innovation as reforms that have social consequences in the form of meeting and creating social needs. Johannessen (2013:1200) and Albury (2011:227) further add that social innovation can provide novel solutions to social problems that are more effective, efficient, sustainable, or just than existing solutions and for which the value created accrues primarily to the society as a whole rather than private individual. Narrowly, social innovation can be defined as changes in the cultural, normative or regulatory structures of the society that enhance the collective power resources and improve its economic and social performance (Heiskala, 2007; Johannessen, 2013:1200). It can be defined as significant expansion of the technology-based concept innovation, but can be intertwined with technology (Johannessen, 2013:1196; Pekkarinen, Hennala, Harmaakaorpi & Tura, 2011:512). Successful innovation means therefore more than Research and Development. Research and Development must be transformed into products and services that will be sold in the market and will lead to added value for stakeholders. Furthermore, Hyland and Beckett (2005) opine that organisations focused on efficiency may have difficulty with some transitions stimulated by an innovation, and some innovative PSOs may be so

turbulent that they do not operate efficiently in a business sense, even though they keep coming up with new ideas. Therefore, this turbulence calls for striking a balance to minimise the disruption brought about by innovation (Hang, Chen & Yu, 2011:14; Russo-Spena & Mele, 2012:547). However, PSO managers should not be cowed by the turbulence that always accompanies innovation, because the gains from the innovation outweigh the problems caused by the turbulence caused by the innovation activities. This is the real motivation for innovation that should drive the PS managers to embrace innovation as the panacea to improving the efficiency and productivity of these organisations. On the other hand, managers should also try to minimise the risk to avoid being faced with massive failure since they are accountable to the government and the general public. However, knowing the nature of innovation perhaps may not be enough to enable subject conceptualisation without understanding its characteristics. In the following section, the study reviews the literature with the intention to obtain a clear picture of the characteristics of innovation as understood through academic discourses.

3.2.3 Characteristics of innovation

Innovative PSOs come up with new ideas and concepts and use these in a flexible manner in managing innovation, to enable the PSOs to continually develop and introduce new products and thereby stay in business (Cankar & Petkovšek, 2013:2). The concept of creative and innovative organisations is based on the people in the organisation. Its processes are built on potential creative and innovative resources in the organisation held by its people (Albury, 2011:229). Innovative PSOs allow people to be trained to be innovative and to use their imagination, to be open to changes, new inputs, flexible, open-minded, and ready to learn new topics and thereby increase their mental capacity (Sørensen & Torfing, 2012:2). Criticisms are always discouraged, particularly if they may hinder personal contributions of the individuals in the PSO. People freely express themselves without hindrances, which only act as enhancers to creativeness and innovativeness (Agolla & van Lill, 2013:170; Cankar & Petkovšek, 2013:7; Petkovšek & Cankar, 2013:1331). Innovation thrives so well in environments characterised by less rigid, bureaucratic, and procedural PSOs, which allow people time and resources to experiment with their perceived intuitive

thoughts (Cankar & Petkovšek, 2013:2; Sørensen & Torfing, 2012:2). The study of innovation in the public sector has not been without challenges, which scholars and practitioners need to take into account as demonstrated in the following section below.

3.2.4 Challenges of innovation

In order to effectively manage innovation in the PSOs it is necessary to be able to understand the conditions under which people tend to generate ideas that are divergent as opposed to incremental (Albury, 2011:230). Challenges facing innovation are disruption of the operations, lack of resources, managerial support, criticisms from superiors or colleagues, and failures among others (Albury, 2011:231). In fact, when the public sector environment is relatively stable, it may be useful to encourage the generation of more incremental ideas that build upon existing knowledge and skills (Huang, Chen & Yu, 2011:8). In this section, the focus is on the challenges to innovation; however, to deal with identified challenges, the study investigates the drivers to innovation in the organisations with special reference to public sector organisations, as indicated in the subsequent sections.

3.3 DRIVERS OF INNOVATION IN THE PUBLIC SECTOR

Innovation is a dynamic process that identifies problems, challenges and development of new creative ideas, and the selection and implementation of new solutions (Cankar & Petkovšek, 2013:3). The recent interest in public sector innovation is based on the assumption that innovation will help the public sector improve its performance and be responsive to the needs of the citizens, and more accountable to the exchequer (Cankar & Petkovšek, 2013:2; Sørensen & Torfing, 2012:2). Previous studies (Agolla & van Lill, 2013:170; Cankar & Petkovšek, 2013:3; Pekkarinen, Hennala, Harmaakaorpi & Tura, 2011:512; Sørensen & Torfing, 2012:2) state that innovation is a process that is influenced by different factors. They opine that the factors that stimulate innovative activities are considered to come from the internal (internal to the organisation itself) and from the external environment. Given the views about innovation as a process, this now begs the question, ‘what factors drive innovation in the public sector’? To answer this question, a review of the

relevant literature on public sector innovation suggests that several theoretical perspectives are needed to study innovation in the public sector (Johannessen, 2013). These include, for example, a synthesis of organisational theory, studies on public policy, innovation theory, and the national system of innovation. The argument here points out that innovation is regarded as a product of several factors, mechanisms and interactive relations influencing the process of innovation (Albury, 2011:230; Valencia, Valle & Jiménez, 2010:475). Hence, the whole system of institutions and organisational elements and processes must be studied to understand the phenomenon of innovation in the public sector (Nyström, 1990). In the conceptual framework (Figure 2.5) an effort is made to integrate external drivers such as: PESTEL (Political, Economic, Social, Technology, Environment and Legal factors) that have not been included fully in earlier studies to come up with a public sector innovation model (Fu & Xiong, 2011:201). Internal drivers are: Strategy, organisational climate, strategic leadership, intrapreneurship, and organisational resources. The factors considered which serve as the drivers of innovation, barriers, outcomes, and measurements are further discussed in the following paragraphs under different headings.

3.4 INTERNAL ENVIRONMENT

Effective government and public services depend on successful innovation to develop better ways of meeting needs, solving problems, and using resources and technologies. The drivers of innovation in the PSOs are to increase the responsiveness of services to the general public. Generally, PSOs are motivated to innovate through the following drivers; persistence to overcome obstacles, motivation for pursuing innovation and entrepreneurship, contain cost pressure, increase efficiency of the public services and improve outcomes, keep up with the public needs and expectations such as provisions of welfare services (Cankar & Petkovšek, 2013:3; Rampersad, Troshani & Plewa, 2012:1377). The internal drivers under scrutiny are: organisation strategy, organisational climate and culture, strategic leadership, entrepreneurship, and management support.

These drivers are likely to drive organisation innovation depending on the level of management commitment and how the PSOs can integrate them into their strategy. For example, a good relationship with customers

may be used as a feedback into the system to improve on the services provided or come up with an altogether new service or products that have never been offered anywhere. Similarly, on the other hand, good supplier relationships could be looked at from the point of better prices, quality raw materials, and timely delivery to ensure there are uninterrupted operations (Rampersad, Troshani & Plewa, 2012:1377). This ensures the smooth flow of supplies to the PSOs, which can be used by the organisational members to experiment. In addition, the absence of resources has been identified as one of the barriers to PSO innovation (Dobni, Klassen & Nelson, 2015:9). Contrary to the above, it should be noted that the availability of resources too is not a solution to innovation in the PSOs because too many resources can also result in too much waste. Therefore, managers should always try to manage these resources wisely as well as providing employees with the resources necessary to carry out the experiment.

Previous studies (Cankar & Petkovšek, 2013:2; Dumay, Rooney & Marini, 2013:622;) identify drivers as support mechanisms for innovation, specifically finance and other organisational support to promote innovation and its implementation. The studies (Cankar & Petkovšek, 2013:2; Dumay, Rooney & Marini, 2013:622; Pekkarinen *et al.*, 2011:510) further suggest the provision of structures and systems designed to promote, stimulate or disseminate innovation. For example, staff suggestion boxes, staff fora, stakeholder feedback mechanisms, networking activities, competence building, and encouragement of divergent thinking.

3.4.1 Organisational strategy

Organisational strategy forms one of the biggest drivers to successful innovation in the PSOs because strategy provides integration and consistency, and enables powerful and easy communication of the strategy to organisational members (Azis & Osada, 2010:175; Cankar & Petkovšek, 2013:2; Dumay, Rooney & Marini, 2013:622; Pekkarinen *et al.*, 2011:510). For example, scholars (Cankar & Petkovšek, 2013:2; Dumay, Rooney & Marini, 2013:622) looking specifically at factors that stimulate innovation and creativity suggest five factors: strategy, structure, support mechanisms, behaviour and communication. Oke (2008:569) states that innovation strategy provides a clear direction and focuses the effort of the entire organisation on a

common innovation goal. Therefore, management needs to develop the strategy and communicate the role of innovation within a company, decide how to use technology and drive performance improvements through the use of appropriate performance indicators (Cankar & Petkovšek, 2013:2; Pekkarinen *et al.*, 2011:510). Similarly in another study Dobni, Klassen & Nelson (2015:9) state that the first step in formulating an innovation strategy is to define what innovation means to the firm or the areas of focus in terms of innovation. By understanding the drivers of innovation needs, a firm can develop its focus areas for innovation. Innovation strategy needs to specify how the importance of innovation will be communicated to employees to achieve their buy-in and must explicitly reflect the importance that management places on innovation. This is only possible when the management of the public sector crafts a strategy that is well integrated and aligned with the organisational critical resources for the successful innovation (Serrano-Bedia, López-Fernández & García-Piqueres, 2012:572). However, research indicates that strategy poses one of the greatest barriers to successful innovation in the PSOs, particularly if it is communicated to organisational members in a cryptic or incomplete manner, hoping that employees will understand how it all fits together (Agolla & Van Lill, 2013).

In their study, Dobni and Klassen (2015:1377) state that an organisation must make sure that employees understand the organisation's vision and mission (which support creativity and innovation) and the gap between the current situation and the vision and mission in order to act creatively and innovatively. Other studies (Murray, Gaulier-Grice & Mulgan, 2010) further point out that serious innovation is linked to organisational strategy. It is through this that the organisations can achieve effective outcomes. Murray, Gaulier-Grice and Mulgan (2010) argue that strategic considerations should drive a significant share of public innovation funding, specifically first identifying priority issues; cost, resources; public concerns; fields where there are gaps between current performance and expectations and secondly, identifying in each field to what extent strategic goals can be met by adopting already proven innovations or developing new ones (Cankar & Petkovšek, 2013:3). It is the strategy that drives the core purpose of PSOs existence. Organisational strategy plays an important role in driving PSOs to innovate.

3.4.2 Organisational climate and culture

Organisational culture is considered as one of the factors that can most stimulate innovative behaviour among members of the organisation (Valencia, Valle & Jiménez, 2010:467). Organisational climate may be defined as the feelings, attitudes and behavioural tendencies, which characterise organisational life and may be operationally measured through the perception of its members (Slåtten, Svensson & Sværi, 2011:278; Ukko & Saunila, 2012:359). It is said that organisational climate is directly related to the organisation's innovation since it reflects the behaviours of its members - "the employees". Scholars (Ukko & Saunila, 2012:359) state that a climate that is characterised by cohesion and support for workers, and also by the intrinsic recognition of temporary workers creates a stimulus for them to invest their time and effort in innovation. Johannessen (2013:1198) defines organisation culture as the pattern of shared values, beliefs and agreed norms that shape behaviour. In addition to this definition, Johannessen (2013:1198) posits that cultural innovations are related to norms, values, expectations and new ways of thinking; new ways of thinking related to ideology. These assertions have been reinforced by previous studies (Choi & Park, 2014:967), that suggest that top echelons should promote an organisational climate in which workers in their posts are recognised for their efforts towards innovation, which, though contrary to the short-term achieving of objectives, should be encouraged and valued for the long-term results of their efforts in terms of innovation. Choi and Park (2014:967) argue that climate reflects the shared knowledge and meaning embodied in an organisation's culture. Similarly, researchers (Valencia, Valle & Jiménez, 2010:469) define organisation culture as the values, beliefs and hidden assumptions that organisation members have in common. On one hand, organisation culture can be regarded as the expression of underlying cultural practices that arise in response to contingencies in the organisation's internal and external environment. On the other hand, Wang, Voss, Zhao & Wang (2015:1377) state that organisational culture that is open to innovation is one of the main preconditions for an innovative organisation to be successful. This is why innovation should begin with the support from the organisation's management. Researchers (Crompton, 2012:100; Santandreu-Mascarell, Garzon & Knorr, 2013:1092) add that innovation strategy should be part of the organisational culture, and organisational

leaders must work to integrate innovation into the very core of an organisation. This is because organisation culture, depending on its key cultural values may have a positive or a negative effect on innovation (Sanz-Valle, Naranjo-Valencia, Jiménez-Jiménez & Perez-Caballero, 2011:1005). Studies have shown that organisational climate and culture, strategy and strategic leadership are not only critical to successful organisational innovation, but also important factors in fostering innovative ideas amongst the organisation members.

3.4.3 Strategic leadership

Organisations that are innovative go for radical change to improve their performance, hence they tend to use strategic leadership to achieve both innovative direction and innovative potential and their long-term success depends on how well they succeed in both these respects (Slåtten, Svensson & Sværi, 2011:278; Ukko & Saunila, 2012:359). Leadership dimensions found related to the innovation possess the following qualities: divergent thinking, critical thinking, technological skills, problem solving, analytical skills, strategic thinking and numerical abilities (Pagon, Banutai & Bizjak, 2008). The above cognitive competencies are found to be very connected to the innovative and change management capacity of public sector managers. In addition, previous studies (Dobni & Klassen, 2015:8; Hu, Gu, Q & Chen, 2013; Ukko & Saunila, 2012:359) indicate stronger linkages between transformational leadership dimensions' of vision, organisational culture, and climate for organisational innovation that suggests greater likelihood of innovative work practices occurring in the public sector. Researchers (Dobni & Klassen, 2015:8; Slåtten, Svensson & Sværi, 2011:278) state that an organisation must first put the right leaders and leadership structures in place in order to kick start the innovation process in any organisation. Top leaders in the organisation usually have the power and authority to develop strategies that lead to innovation, which means if they are unable to perceive opportunity for renewal, do not wish to exploit them, or are unable to respond to them, these leaders can impede innovation. The evidence suggests that strategic leadership is also related to entrepreneurial activities in organisation. In addition, strategic leadership is known to possess such attributes as entrepreneurial skills, opportunity

seeking, proactive, creative, visionary and relentless in search for opportunities. Similar attributes also have been identified in entrepreneurship as shown in the sub-section below.

3.4.4 Entrepreneurship

In the foregoing section, a relationship has been established between strategic leadership and entrepreneurship as combination necessary for innovation in the organisation. Studies suggest that entrepreneurship and innovation are interlinked, because innovation is the specific tool of entrepreneurs, the means by which they exploit changes as an opportunity for a different business or service (Santandreu-Mascarell, Garzon & Knorr, 2013:1084). Entrepreneurship forms an important factor as an innovation driver in an organisation. Roberts (2002) defines public sector entrepreneurship as the process of generating a novel idea and implementation of the innovative idea into public sector practice. On the other hand, scholars (Sarri, Bakouros, & Petridou, 2010:279; Xu, 2011:919) view public sector entrepreneurship as the process of creating value for citizens by bringing together combinations of public sector and/or private resources to exploit social opportunities. They ‘put ideas into action’. Entrepreneurial innovation is the process by which staff activates new ideas in their organisation (Dumay, Rooney & Marini, 2013; Santandreu-Mascarell, Garzon & Knorr, 2013:1091). Successful entrepreneurship requires a combination of three sets of skills: psychological, interpersonal and technical (see Ettie, Groves, Vance & Hess, 2014:315; Kallio & Lappalainen, 2015:157). Innovation and entrepreneurship are interlinked because innovation is the specific tool of entrepreneurs, the means by which they exploit changes as an opportunity for different business or service (Mascarell, Garzon & Knorr, 2013:1084).

Psychological skills refer to the mindset and mental skills necessary for successful entrepreneurship (Papzan, Afsharzade & Moradi, 2013:45). These essential mental skills include passion, commitment, confidence, self-awareness, willingness to learn, action orientation, psychological resilience, and tolerance of uncertainty (Ettie, Groves, Vance & Hess, 2014:315; Sarri, Bakouros, & Petridou, 2010:279). Interpersonal skills refer to those skills that revolve around managing key relationships and relationship-based settings vital to new

venture success (Kallio & Lappalainen, 2015:157). Essential interpersonal skills include sales skills, negotiation skills, team skills, influencing decision makers and general communication skills (Santandreu-Mascarell, Garzon & Knorr, 2013:1091). Technical skills include areas such as concept development, strategy, planning, market research, economic evaluation, marketing, financial control, risk management, intellectual property management and resourcing (Santandreu-Mascarell, Garzon & Knorr, 2013:1091).

It is worth noting that real entrepreneurs must innovate. Studies by Ettlie, Groves, Vance and Hess (2014:131), and Galindo and Méndez-Picazo (2013:511) go further to add that innovation is the specific instrument of entrepreneurship. It is the act that endows resources with a new capacity to create wealth. An entrepreneur always searches for change, and exploits it as an opportunity. An entrepreneur sees change as a norm and something that should be embraced as on-going organisational transformation (Santandreu-Mascarell, Garzon & Knorr, 2013:1084). An entrepreneur is never static in his/her actions, he/she tries new things, seeks for change that adds value to the organisation. An entrepreneur is an adventurous individual who keeps on seeking for an opportunity with the aim to exploit it for the benefit of the organisation (Santandreu-Mascarell, Garzon & Knorr, 2013:1091; Sarri, Bakouros, & Petridou, 2010:279). However, entrepreneurship alone without organisational resources cannot translate into real innovation, therefore the evidence suggests that for innovation to take place in organisations, there should be adequate organisational resources. The research shows that resources are significant factors in the growth of organisations and performance (Liu, 2011:242).

3.4.5 Organisational resources

In the previous four sections, the organisational strategy, organisational climate and culture, strategic leadership and entrepreneurship have been defined and relationships between them reviewed. Also reviewed are the key attributes that determine the effective allocation of organisational resources to the organisation members. Organisational resources include both tangible and intangible resources that are attributed to an organisation and that support an organisation's competencies and therefore contribute to the delivery of the organisational value proposition to its various stakeholders (Liu, 2011:253; Mele, Spena & Colurcio, 2010:76). Intangible resources in this case may include the workforce's skill sets, depth of expertise and breadth of experience. Researchers (Marr, 2009:49; Ukko & Saunila, 2012:359) posit that human resources can be thought of as the living and thinking part of the intangible resources. These resources therefore walk out at night when people leave, whereas relational and structural resources usually remain with the organisation even after people have left. Human resources include skills and knowledge of employees, as well as know-how in certain fields that are important to the success of the enterprise, plus attitudes and aptitudes of its staff (Ukko & Saunila, 2012:359; Wojtczuk-Turek & Turek, 2015). However, the question here is not the skills and knowledge per se, but how the management manages these intangible resources through effective rewards systems, autonomy, and opportunities for further development. It is possible for the organisation to realise the full potential of its workforce if their skills and knowledge are continuously updated. For example, if an organisation wishes to benefit from invisible knowledge, this knowledge must be elicited, shared and codified into explicit knowledge. Similarly, Ruiz-Jiménez and Fuentes-Fuentes (2013:526) study indicates that human capital that covers the skills, creativity and experience of individuals, is the most valuable resource for innovation. Ruiz-Jiménez and Fuentes-Fuentes (2013:527) further suggest that organisations should invest in human capital by improving education, training, creating learning opportunities and developing innovation skills of their workforce.

Studies (Cankar & Petkovšek, 2013:3; Sandhu, Jain & Ahmad, 2011:207; Sanz-Valle, Naranjo-Valencia, Jiménez-Jiménez & Perez-Caballero, 2011:1007) reveal that training and continuous learning within organisations enhances members' skills that can be very crucial to the organisation's innovation. Training activities may involve the integration of creativity with training into an individual employee's personal development training within the organisation. Ruiz-Jiménez and Fuentes-Fuentes (2013:525) state that organisations' employees combine their knowledge when they have the ability not only to absorb this knowledge, but also to integrate it to generate new knowledge, giving rise to opportunities to improve the functioning of the firm. Therefore, some employees need to become specialists in spotting, developing and growing ideas, while others, particularly gatekeepers, need to know how to recognise the condition for innovation (Murray, Gaulier-Grice & Mulgan, 2010). In addition, innovation generally should include a licence to take appropriate risks and be part of personal development plans (Murray, Gaulier-Grice & Mulgan, 2010).

Training should be designed to elicit more than just on-the-job performance, but to allow employees to use their creative minds to the fullest. Such training will enhance employees' capabilities and make them think outside the box. The training should include experiment-based activities where employees are tasked to come up with new projects and implement them (Ruiz-Jiménez & Fuentes-Fuentes, 2013:523). This includes project conceptualisation, design, implementation, monitoring and commercialisation of the ideas generated by the project members. There is evidence (Sanz-Valle, Naranjo-Valencia, Jiménez-Jiménez & Perez-Caballero, 2011) that this type of training offers more competitive advantage than just routine job training. Research (Ruiz-Jiménez & Fuentes-Fuentes, 2013:523; Wojtczuk-Turek & Turek, 2015) reveals that some successful multinational organisations use this training strategy to gain a competitive edge over their competitors. The public sector also can benchmark this good practice from the private sector since it has proved to be successful. For example, a study by Sabir and Sabir (2010:214) suggests that innovation is the most important factor to be considered for enhancing the competitiveness of a nation, industry or organisation.

However, since organisational resources are controlled and manned by the management, the organisation management support in terms of willingness to provide those critical resources to foster innovation activities is crucial. This is because innovation activities require the availability of substantial resources to carry them out successfully.

3.4.6 Management support

In the foregoing section, the study has shown how organisational resources are critical in the success of an organisation and how management can ensure that the resources are availed to the organisation's members for innovation activities. In any organisation, the management support and commitment play a critical role in ensuring that organisation members work towards the attainment of the organisational objectives. Since management occupy strategic position within the organisation, they have the exclusive authority to generate new ideas and make decisions at strategic routine level (Kesting & Ulhøi, 2010:72). In order to achieve a broader organisation, management should promote and support innovative ideas from employees and consider how they can adjust existing schemes incentives and rewards accordingly (Fryer, Ogden & Anthony, 2013:491; Proctor, 2013:183; Kesting & Ulhøi, 2010:79). Scholars (Fryer, Ogden & Anthony, 2013:491; Kesting & Ulhøi, 2010:79) point out that management must adjust some of their training activities in programmes that foster increased collaboration and sharing of ideas, and realise that employees need a clear and shared sense of the wider scope and bounds of their involvement. Lopez and Esteves (2013:100), for example, state that top management are critical in creating internal and external networks and act as enablers of knowledge acquisition and appropriation that can be used to promote innovation within the organisation. This is because top managers are the sponsors and facilitators of innovation. Therefore, it is in the external environment that such networks between innovation actors can be found and be linked to the process of organisation innovation activities.

3.5 EXTERNAL ENVIRONMENT

The external environment includes a wide variety of needs and influences that can affect the organisation, but which the organisation cannot directly control. Influences can be political, economic, ecological, societal and technological in nature. An effective organisation is regularly exchanging feedback with its external environment- it is an open system. This is because open systems take inputs (resources) from external environments and transform them into outputs - goods or services (Cankar & Petkovšek, 2013:3). Therefore, effective organisations regularly try to understand the environments through the use of environmental scanning, market research and evaluations. Public sector organisations' external environment consists of interrelated sets of factors that play a vital role in determining the opportunities, threats and constraints the PSOs face.

There is agreement among scholars (Lopez & Esteves, 2011:100) that an innovation spiral does occur, and in order to study such an innovation spiral, the processes will be influenced by different factors, both external and internal to the organisation (Laforet, 2011:382; Park, Amano & Moon, 2012:518). The organisation influences the environment through the output of innovation or new added value for its stakeholders. On the other hand, the external environment influences the organisation, creating new knowledge and information out of the environment indirectly by learning processes (Merx-Chermin & Nijhof, 2005:139). Business environments under which PSOs operate are highlighted in the subsequent sub-topics.

3.5.1 Political factors

These refer to government legislation and policies that include, for example, local or national funding policies, priorities about goods and services that government wants to provide, taxation policies, trade restrictions and tariffs, and investment incentives; the level of political stability may even be a significant issue in some markets (Hang, Chin & Yu, 2011:6). Political decisions can impact on many vital areas for organisations such as the education of the workforce, the health of the nation and the quality and type of the

infrastructure of the economy such as the road, rail, air and water transport system (Fu & Xiong, 2011: 213). Innovation is also driven by the need to keep up with public needs and expectations such as provision of welfare services, efficiency, cost cutting in the service provisions and accountability to the general public and government (Lee, Hwang & Choi, 2012:149). Strategic change in the public sector frequently requires a strong top- down, political will coupled with the political recognition that change requires the allocation of substantial resources (Liu, 2011:253).

Studies (Ozer, Demirkan, & Gokalp, 2013:300) indicate that this political push is based on ideology or is in response to critical events and pressures. It goes further to reveal the adoption of new worldviews and concepts. Thus, in several countries, successive political ideologies have sought free market solutions mainly to ameliorate the enormous financial burden imposed by “a free” (at the point of delivery) public service and also, indirectly, to provide incentives for improved service delivery. At the delivery level, political goals may be reflected through the imposition of performance targets (which may facilitate innovation although with the danger that, as with most indicators, they can distort the behaviour of actors within the system in unanticipated and possibly undesirable ways).

Researchers (Park, Amano & Moon, 2012:518), for instance, identify enabling environment factors as stable socio-political conditions, availability of basic physical infrastructure like electric power, transportation and telecommunications, institutional infrastructure and mechanisms for mobilisation of “investible resources”, and providing institutional support for the development of sustainable innovation capacity. In addition, studies (Wei & Liu, 2015:50) point out that, to achieve sustainable innovation capacity, government must transform economic agencies, statutory bodies, and public organisations to embrace and champion innovation-friendly rules, regulations and legislation, with the objective of moving towards a freer and more flexible framework under which a vibrant business environment favourable to innovation can prosper.

Government is known to play a critical role in creating an enabling business environment through the enactment of appropriate legislative business policies and regulations (Proctor, 2013:171). Goh (2005:218),

Ball (2011:11) and Wei and Liu (2015:50) posit that, for any innovation-driven economy particularly in the developing countries to be achieved, the objectives of industrial policy-making should aim to achieve an accelerated pace of competitive and sustainable industrial growth within a functional framework of increased market orientation and private-sector led development. In addition, the objectives would inevitably be met if a country seeks to transform its national economy by pursuing an industrial policy that is predominantly rooted in innovation imperatives (Proctor, 2013:171).

Government's role in public sector innovation is well documented in various literature on public sector organisations (Lee, Hwang & Choi, 2012:149). Goh (2005), for example, carried out a study on the role of government in Singapore and found that, to extract the full benefits of any industrial policy by governmental facilitation, one must also recognise that governments cannot create innovation; ultimately only firms can, and should. Hence, in many instances, the best form of governmental facilitation in any industrial policy measure is to dismantle, reduce and minimise potential barriers, obstacles, and restrictions. For example, countries like the USA, the UK, Japan, France, Germany, the Netherlands, Canada, and Sweden were among the first developed nations to enact industrial policies that took into consideration the concept of national innovation systems (NIS) to replace the more general industrial policies of yesteryear (Ball, 2011:11; OECD, 2010). The UK, for example, adopted industrial policies with legislation directed towards the institution of taxes and financial measures (see Goh, 2003; OECD, 2005a). On the one hand, in the USA, for example, half of the measures were related to the regulation of innovation activities with laws enacted to establish the legal limits of these activities. On the other hand, Japan, the Netherlands, Canada, and Sweden were more concerned with the impact of innovation pursuits on national interests and hence industrial policies were oriented to addressing innovation inputs (Goh, 2005). Goh (2005) posits that countries such as France and Japan consistently view state involvement in large-scale innovation programmes undertaken by the private sector as essential to produce effective results. However, Goh's (2005) study found that overall innovation-driven industrial policies are treated as subordinate to economic policy, and as a result, are intended to foster a positive climate for innovation pursuits through a series of relatively flexible policies as ancillary economic

measures. Therefore Wei and Liu (2015:50) warn that developing nations such as Kenya should formulate their own industrial policy according to their unique political and socio-economic conditions.

Government institutions must play a catalytic function to develop an innovation-driven economy. The experience of developed countries has evidently demonstrated that a shift of government's industrial policy-making towards an innovation-driven economic strategy is absolutely critical (Carstensen & Bason, 2012:3; Lee, Hwang & Choi, 2012:150). Wei and Liu's (2015:50) study clearly indicates how government can formulate friendly innovative policies through enactment of various legislation and policies that are innovation driven. In the absence of such innovation- friendly policies, it becomes difficult for the public sector to innovate. In developing nations like Kenya, innovation that impacts industrial growth should be concerned with the efficient utilisation of scientific, technical, organisational and managerial assets that inherently stimulate the rate of industrial development (Wei and Liu, 2015:50). On the other hand, industrial policy should not only address the concerns of efficiency gains and productivity increases, but must also maximise entrepreneurial opportunities. It must empower public sector organisations to move beyond mere production or manufacturing (Goh, 2005:219). The study further suggests that once innovation becomes the lifeblood of the public sector and mainstay of the organisation's activities, economic upgrading can be sustained through the following: creating highly skilled-jobs, producing world class exports and fuelling high industrial growth- which is the outcome of an innovation-driven economy.

OECD (2010) summarises policy principles for innovation as follows: *First empowering people to innovate* through education and training systems with the aim to equip people with the foundations to learn and develop the broad range of skills needed for innovation in all of its forms, and with the flexibility to upgrade skills and adapt to changing market conditions. To foster an innovative workplace, government must ensure that employment policies facilitate efficient organisational change. Policy must enable consumers to be active participants in the innovation process through feedback on the products and services that are being offered, and fostering an entrepreneurial culture by instilling the skills and attitudes needed for creative enterprise (OECD, 2010).

Secondly, unleashing innovation by ensuring that framework conditions are sound and supportive of competition, conducive to innovation and are mutually reinforcing. Mobilise private funding for innovation by fostering well-functioning financial markets and easing access to finance for new firms, in particular for early stages of innovation (OECD, 2010). Encourage the diffusion of best practices in the reporting of intangible investments and develop market-friendly approaches to support innovation. Foster open markets, a competitive and dynamic business sector and a culture of healthy risk-taking and creative activity. Foster innovation in small and medium-sized firms, in particular new and young ones.

Thirdly, creating and applying knowledge. This involves the provision of sufficient investment in an effective public research system and improving the governance of research institutions (OECD, 2010). Ensure coherent multi-level sources of funding for R&D (Datta, Reed, & Jessup, 2013:160). Ensure that a modern and reliable knowledge infrastructure that supports innovation is in place, accompanied by the regulatory frameworks, which support open access to networks and competition in the market. Create a suitable policy and regulatory environment that allows for the responsible development of technologies and convergence. Facilitate efficient knowledge flows and foster the development of networks and markets that enable the creation, circulation and diffusion of knowledge, along with an effective system of intellectual property rights (Huang, 2012:130). Foster innovation in the public sector at all levels of government to enhance the delivery of public services, improve efficiency, coverage and equity, and create positive externalities in the rest of the economy.

Fourthly, apply innovation to address global and social challenges. This involves improvement of international scientific and technological co-operation and technology transfer, including the development of international mechanisms to finance innovation and share costs. Provide a predictable policy regime that provides flexibility and incentives to address global challenges through innovation in developed and developing countries, and encourages invention and adoption of cost-effective technologies (OECD, 2010).

Lastly, improve the governance and measurement of policies for innovation. This is meant to ensure policy coherence by treating innovation as a central component of government policy, with strong leadership at the

highest political levels (Carstensen & Bason, 2012:150; Lee, Hwang & Choi, 2012:150; OECD, 2010). Enable regional and local actors to foster innovation, while ensuring coordination across regions and with national efforts. Foster evidence-based decision making and policy accountability by recognising measurement as central to the innovation. If policies to promote innovation are to be effective, they need to take into account the ways in which innovation takes place today. To transform ideas and inventions into innovation requires arrangement of activities, including organisational changes, organisation level training, testing, marketing and design (OECD, 2010; Huang, 2012:130).

Another state role can be found in general procurement. The Public sector can place an order for a product (a good or service- or a system) that does not exist at the time, but could probably be developed within a reasonable period of time (Edquist, 2009). The public sector functions both as a source of innovation and a consumer of new products, processes and other methods. Through this public demand oriented towards innovation solutions and products, the public demand has the potential to improve delivery of public policy and services that is often generating improved innovative dynamics and benefits from the associated spill overs (Bloch, 2005; Georghiou, 2007:949). At first, government procurement is generally organised such that innovation becomes an essential criterion in the call for tenders and assessment of tender documents. A second form occurs when the demand for certain technologies, products or services is encouraged in order to stimulate the market (Conteh, 2012:470). Other studies (Li, 2012:76; Wei & Liu, 2015:50) advocate for government investment in innovation as a core policy platform that is necessary in strengthening the scope and competitiveness of industry; thus spurring economic growth, creating employment and wealth opportunities. It is well known (Pekkarinen, Hennala, Harmaakorpi & Tura, 2011:509; Lee, Hwang & Choi, 2012:150) that PSOs are the creation of a legislative act; therefore, their operation is prescriptive under what is known as a mandate. To fulfil its mandate, PSOs are required to operate under some set of given parameters. The mandate imposes some degree of constraint to innovation.

Porter and Stern (2002) state that innovation activities of the organisations within a country are strongly influenced by national policy and the presence and vitality of public institutions. They argue that innovation

intensity depends on an interaction between private sector strategies and public sector policies and institutions. Governments are known to play a critical role in creating an enabling business environment through the enactment of an appropriate legislative framework, business policies and regulations. Finally, studies (Eriksson, 2014:163; Li, 2012:77; Wei & Liu, 2015:50) point out that, to achieve an innovation-driven economy, particularly in developing countries, the objective of industrial policy generation should be to accelerate the pace of competitive and sustainable industrial growth within a functional framework characterised by increasing market orientation and private sector led development. In addition, objectives could be achieved if a country seeks to transform its national economy to be innovation-driven by pursuing an industrial policy that is predominantly rooted in innovation imperatives (Carstensen & Bason, 2012).

3.5.2 Economic factors

In the case of PSOs, the rate of economic growth, interest rates, exchange rates and inflation rates influence both an organisation's cost of resources and its customers' demand for services and products (Laforet, 2011:383; Marr, 2009:37). Therefore, organisations may pursue innovation to counter the effects of one or all those factors perceived as a threat to its survival in both the short and long run. Innovation in the PSOs is driven by pressures to contain costs, increase the efficiency of the public services, and to improve outcomes (Laforet, 2011:385; Lee, Hwang & Choi, 2012:150). It is argued that, without innovation, public service costs tend to rise faster than the rest of the economy (Mulgan & Albury, 2003:5; Laforet, 2011:385). In addition, without innovation, the inevitable pressures to contain costs can only be met by forcing already stretched staff to work harder (Mulgan & Albury, 2003). Other economic factors can come from the competition although public sectors are protected by the very nature of the services that they provide since they in most cases enjoy a monopoly except in health, water, roads, and many others. Economists have long recognised the critical importance of innovation and capital accumulation for growth ((Eriksson, 2014:163). Empirical evidence and modern theory of economic growth provide strong support for this claim that long term economic growth requires not only capital, but also an understanding of innovation (Eriksson, 2014:163; Juma & Yee-Cheong, 2005:27). Scholars further argue that focusing on accumulating capital will not be sufficient to ensure long-

term rates that can reduce poverty and help achieve the other goals (Juma & Yee-Cheong, 2005). Innovation and technology are also needed to transform countries from reliance on exploitation of natural resources to technological innovation as the basis for development (Juma & Yee-Cheong, 2005).

3.5.3 Social factors

Social factors should be perceived to be those factors that are external to the organisation, hence there is very little that organisations can do to influence them fully. However, with the application of innovation, the social factors such as demographic changes, diseases, poverty and hunger can be well managed and brought under control (Erakovich & Anderson, 2013:164; Lee, Hwang & Choi, 2012:151). Social factors exert enormous pressures on most countries in both the developing and developed world. The pressures range from high demand for housing in urban centres, quality water, electricity, quality medical facilities, quality food and the need to control natural calamities. In most developing countries, governments are expected to play a critical role in responding to social factors such as high population growth, poverty, hunger and famine, and disease through effective mechanisms (Sun *et al.*, 2013:369). This brings into question the role of PSOs in the provisions of goods and services to citizens. The public sector acts as a catalyst in the provision of essential services to the citizens, hence the adoption of innovation will naturally help overcome the problems associated with the social demands (Rolfstam, Phillips & Bakker, 2011:458).

The study by Reynoso, Kandampully, Fan & Paulose, (2015:158) further suggests that improved access to clean energy could play a role in improving health by reducing indoor air pollution, and increase the efficiency of agricultural production, hence assuring the country's food security. This can be achieved through cost-effective agricultural applications of Nano-technology, which have been found to decrease malnutrition, and childhood mortality, in part by increasing soil fertility and crop productivity (Reynoso *et al.*, 2015:158). Innovation also can solve perennial problems such as HIV/AIDS that is prevalent in most developing countries, particularly Kenya (Juma & Yee-Cheong, 2005:71). It is in such a situation that PSOs play an important role in helping the government to tackle such problems.

In an economy, an ageing population, for example, may have an impact on the health care system of a country as people live longer (Pekkarinen, Hennala, Harmaakorpi & Tura, 2011:519). This may require provisions to be made to cater for the ageing population in terms of health facilities, housing and other social welfare provisions (Erakovich & Anderson, 2013:164). This needs a creative and innovative way to tackle such pressure on the government. In addition, innovation in the PSOs is driven by the desire to improve outcomes in the PSOs in order to alleviate the ever-increasing high levels of unemployment as a result of increased population seeking employment in the urban centres (Cankar & Petkovšek, 2013:3). Other scholars (Clark, Good & Simmonds, 2008:5; Erakovich & Anderson, 2013:164) in their study of the PSOs identified the following factors as the drivers to innovation in the PSOs, namely, political push that requires strategic change in the PSOs and strong top-down, political will coupled with the political recognition that change requires the allocation of substantial resources.

Pressures for improved service and quality form a central theme in the adoption of innovation in public sector organisations (Kingsland, 2007; Laforet, 2011:384). Such pressures are always present at both national and local levels of administration (Clark, Good & Simmonds, 2008:5; Pekkarinen, Hennala, Harmaakorpi & Tura, 2011:519).

3.5.4 Technological factors

Technological advances that have an impact on an organisation and its level of automation achievement and potential provide flourishing ground for innovation activities that result in new or improved goods and services (Lewrick, Chen, Raeside & Omar, 2012:256; Marr, 2009:37). With an ever-increasing rate of technology changes, there is a need for the public sector to keep up. Khilji, Mroczkowski and Assudani (2012:258) argue that technology and automation can reduce costs and open the door for innovation; it can also change the demand for services and products. First, customers are more likely to demand innovative products and services as opposed to traditional and old-fashioned ones; secondly, technology produces superior products and services at lower costs, hence there is the likelihood of increased demand for such

outputs from the customers as the prices may be competitive (see, Heidenreich & Handrich, 2015). For example, the current demand for online services provided by government bodies to the general public has really revolutionised the levels of products and services offered to the citizens (Jack, Anderson & Connolly, 2014:272). It is clear that technological innovation can be a strong determinant or driver for subsequent innovation.

On one hand, the introduction or availability of new technology, for example, telemedicine or advanced data storage and handling capabilities may provide an opportunity for another form of innovation (process, organisational, delivery, system interaction) to take place or to be implemented (PUBLIN, 2005:45). On the other hand, Jack, Anderson and Connolly (2014:272) state that innovation involves the application of various types of technologies, processes, techniques, organisational, social and other forms of codified knowledge. It requires the integration of human imagination, intuition and creativity at all levels to achieve success (Reynoso *et al.*, 2015:158). However, in developing countries like Kenya, where technological advancement is still lagging behind, there is a possibility of failure to integrate such innovation mechanisms due to technological incapacitation, hence the reason why most public sector organisations in the developing world are not innovative in their orientation as compared to other PSOs in the developed world (Reynoso *et al.*, 2015:157). Technology can be an avenue for economic growth and development particularly for third world countries such as Kenya.

3.5.5 Collaboration with industries/universities/research organisations

In order to drive innovation, it has become imperative that public sector organisations foster alliances with industry, research institutions and universities (Hossain, 2013:31; Lee, Hwang & Choi, 2012:151). It is these alliances that bring different ideas and avenues for new technologies that can be used to spur innovation across the different sectors of the economy. Researches (Albury, 2011:228; Lee, Hwang & Choi 2012:159; Stankovic, 2013:151; Tsekouras, Poulis & Poulis, 2011:325) indicate that it is not in doubt that innovation no longer depends only on how public sectors, universities, research institutions or government regulators

perform on an individual basis, but on how they work in unison. On the other hand, Lee, Hwang and Choi (2013:149) state that institutional, organisational and societal rigidities that stifle national innovation systems must be eradicated and obstacles that prevent co-operation and networking have to be removed, while collaboration and partnerships should be promoted. Studies (Adler, Heckscher, & Prusak, 2011:96; OECD, 2010; Serrano-Bedia, López-Fernández, & García-Piqueres, 2012:572) suggest that organisations establish relations with suppliers, competitors, customers, financial institutions, technological, and marketing partners to promote innovation. The innovation system increasingly depends on a sufficient degree of interaction among firms, universities, research institutions and regulators (Jauhari, 2013:305; Lee, Olson and Trimi, 2012:827).

A National Innovation System (NIS) is used to denote a country's collective efforts towards fostering technological innovation (Manzini, 2012:1). However, in the context of this study, innovation system is used to mean the collaborative nature that is geared towards forming networks between organisations to foster innovation through sharing of best ideas. Public sector organisations can forge linkages with universities and public research organisations to carry out R&D and, in turn such outputs of the research base can be made available for economic exploitation by all collaborators (public, private and universities) (Jauhari, 2013:305; Park, Amano, and Moon, 2012:518). These linkages and networks of universities-public sector organisations can enjoy a comparative advantage, as science-based innovation increasingly requires multidisciplinary knowledge and builds on people-based interactions (Proctor, 2013:176). Previous studies (Adler, Heckscher, & Prusak, 2011:96; Hurmelinna-Laukkanen, 2011:303) show that fostering linkages between universities and public sector organisations whose legal framework and internal incentives make researchers uninterested in working with PSOs, and firms who have little need for the outputs and cannot absorb them anyway, will achieve little.

In other studies (Choi & Park, 2014:968; Goh, 2005) state that institutional, organisational and societal rigidities that stifle national innovation systems must be eradicated and obstacles that prevent co-operation and networking have to be removed, while collaboration and partnerships should be promoted.

Collaboration among various players (Public sector, universities, industries and research organisations), involve creating a flourishing climate that facilitates innovation in the public sector organisations and that can be exploited by other collaborators (Sarri, Bakouros, & Petridou, 2010:279). The rates of innovation drivers depend on how the public sector takes in both internal and external factors to create catalysis (Erakovich & Anderson, 2013:169; Ukko & Saunila, 2012:359). The interface between various collaborators aids in value-creating, barrier-crossing, resource-harnessing cooperation of organisations and collaboration of people across ranks, jurisdictions, and sectors (OECD, 2010; Proctor, 2013:176). The collaborations create an open-house scenario, which allows for continual sharing and dispels fear of failure that leads to an atmosphere in which innovation thrives (Rampersad, Troshani & Plewa, 2012:1377). The organisation virtually taps into the minds of all its members at this stage to produce novelty. Innovation rarely occurs in isolation; it is a highly interactive process of collaboration across a growing and diverse network of stakeholders, institutions and users (Chetty & Stangl, 2010:1725; Karré & Twist, 2012:2).

It is well known (Hossain, 2013:30; Lee, Hwang & Choi, 2012:156) that the public sector, just like the private sector, sources external knowledge through partnerships, alliances and joint ventures with external parties through the acquisition of knowledge, for example, through contract, Research and Development and licensing of patents (Datta, Reed, & Jessup, 2013:165; Hurmelinna-Laukkanen, 2011:303; Lee, Hwang & Choi, 2012:149). The public sector also increasingly seeks external partners, partly through emerging knowledge markets, to commercialise innovations that are not used internally (Hossain, 2013:30; Lee, Hwang & Choi, 2012:156; Ozer, Demirkan, & Gokalp, 2013:300). The effective management and reinforcement of intellectual property (IP) is crucial to these arrangements, not only to identify useful external knowledge, but also to leverage a firm's intellectual assets to create value (Bellantuono, Pontrandolfo & Scozzi, 2013:562; OECD, 2010; Reed, Storrud-Barnes & Jessup, 2012:69).

The public sector needs to have sufficient capacity to create, manage and evaluate such partnerships (Lopez & Esteves, 2013:87; OECD, 2010). This may not only involve partnership per se, but also networking through markets and other mechanisms, including interactive learning among different organisations

(potentially) involved in the innovation processes (Bienkowska, Larsen & Sörlin, 2010:211; Stankovic, 2013:151). In addition, studies (Choi & Park, 2014:958; Ettlie, Groves, Vance and Hess, 2014:313; Seo, 2006:2) on South Korea Techno-Parks reveal how collaboration and linkages create a flourishing climate for innovation. Innovative activities involve many actors and come from a combination of commentary and specialised competencies and knowledge of various actors. It is this combinations and linkages of different actors that PSOs need to tap into in order to become innovative ventures and remain competitive.

It is well documented (Belkahla & Triki, 2011:654; Murray, Gaulier-Grice & Mulgan, 2010; Proctor, 2013:176) that organisational networks form an important seedbed for cross-pollination of ideas across the organisational structure (Chetty & Stangl, 2010:1725). These networks may vary considerably; first it may be pollinating networks, where networks deliberately cross-pollinate ideas, sharing emerging practice, to stimulate creativity (Datta, Reed, & Jessup, 2013:165; Jin, Wu & Chen, 2011:11). Secondly, it can be collaborative networks with the aim of bringing teams across the organisational boundaries or country borders (Lopez & Esteves, 2013:88; Murray, Gaulier-Grice & Mulgan, 2010). These collaborative networks can include online platforms to ensure rapid transmission of information, which is vital in enhancing innovation networks (Lopez & Esteves, 2013:99; Murray, Gaulier-Grice & Mulgan, 2010). Knowledge is considered as one of the most important drivers of the economy today and will continue to be so in years to come. Knowledge is continuously generated throughout an organisation. To be successful and remain competitive, firms must ensure that knowledge is managed in the most effective manner (Sandhu, Jain & Ahmad, 2011:207).

3.5.6 Suppliers and customers

Recent studies (Mele, Spena & Colurcio, 2010:76; Reed, Storrud-Barnes, & Jessup, 2012:69 Spicker, 2011) emphasised the significant role that suppliers and customers play in product and service innovation. On the other hand, some researchers (Spicker, 2011; Mele, Spena & Colurcio, 2010:76) indicate that suppliers and customers play a vital role in the organisation's innovative capabilities. Many organisations have realised that

the involvement of customers and suppliers helps in the improvement of an organisation's products. This assertion has been reinforced by Laforett's (2011:382) study, which indicates that customers drive innovation, if organisations work closely with their customers. Therefore, the involvement of customers and suppliers as innovators can result in more innovative services of greater customers-suppliers value. Customers and suppliers have been found to act like a seedbed for organisational innovation as they determine the nature and characteristics of the services and products they need.

A number of studies (Luo, Mallick & Shroeder, 2010:244-5; Tsekouras, Poulis & Poulis, 2011:322) on collaborative product development found that there are tangible benefits that accrue to the organisation in such collaborations with customers and suppliers, namely, faster product development, reduced product development cost, increased flexibility, reduced risk, and access to product development capabilities of the suppliers (Elmqvist, Fredberg & Ollila, 2012:342). Lately, the idea of generating innovation through collaboration has gained significant momentum and, as a result, innovation and collaboration became the main focus of the World Economic Forum in Davos Switzerland (Business Week, 2008:16; Lee, Hwang & Choi, 2012:149). In order to innovate, PSOs must consider customers as an important component of the innovation process. This is because customers are a main source of new ideas for products, processes, and services.

Studies have shown that customers are useful when it comes to identifying problems and weaknesses (Bellantuono, Pontrandolfo & Scozzi, 2013:562). In addition, some customers face greater needs than others and are interested in engaging in the innovation processes in order to push the barrier of usage for particular products, processes, and services (Heidenreich & Handrich, 2015). Some current studies (Lee, Hwang & Choi, 2012:149) found that these customers who are lead users can be a source of innovation because they encounter needs far in advance of the majority of the market. The reason is that these customers place demand for what is not already offered in the market, therefore organisations will try to produce such products and services to satisfy such higher demand (Heidenreich & Handrich, 2015; Lee, Hwang & Choi, 2012:149).

3.5.7 Implementation

Once incubation is over, the organisation must now embark on the implementation process that involves commercialisation of the services or products. This involves mass production of the services or products to the markets (Datta, Reed, & Jessup, 2013:165). Marketing of the products and services are intensified to get them to the customers. Rogers (2003:179) points out that the implementation stage occurs when an organisation puts innovation to use. This may involve an overt behaviour as the new idea is actually put into practice. Rogers further adds that the implementation stage may continue for a lengthy period of time, depending on the nature of the innovation. This prolonged implementation, Rogers argues, is due to the fact that new ideas need to be institutionalised as a regularised part of an adopter's on-going operations. It may also mean termination of the innovation decision process.

3.6 MEASUREMENT OF INNOVATION

3.6.1 Investment in research and development

Historically, innovation has been treated as a residual measure after accounting for other factors of growth. The primary goal of measuring innovation is to improve the understanding of economic growth as a result of innovative activities in the economy (Ghazal & Zulkhibri, 2015:252; Rose *et al.*, 2009:1). For instance, scholars (Sammuto-Bonnici & Paroutis, 2013:927; Saunila & Ukko, 2012) identified measures of innovation as investment in research and development (R&D) and patents registration. However, first using R&D as an innovation indicator also has its limitations since patents indicate inventions and these may not become innovation; secondly, not all inventions are patented by organisations due to the alternative of trade secrecy; thirdly, some types of inventions cannot be patented; fourthly sectors vary in the intensity of use made of the patent system; fifthly, some patents are used as purely anti-competitive strategy and last, different countries have stricter or looser regimes relating to patent awards (Ghazal & Zulkhibri, 2015:252; Greenhalgh & Rogers, 2008; OECD, 2010).

On the proposal for new innovation measurement submitted to US Department of Commerce, Economics and Statistics Administration, Kingsland (2007:1) points out that innovation is nebulous and measuring innovation is inherently subjective and imprecise. Rogers (1998:9) points out that the measurement of innovation is likely to be difficult due to the broad nature of the scope of innovative activities. OECD (2009), for instance, argues that aggregate measures of research and development spending are a misleading indicator of innovative activities for two reasons: they are influenced by organisation size; and research and development spending do not capture a lot of innovation. Gilbertson, (2002), Tan (2004:10), and Kingsland (2007:1), respectively carried out studies on measurement of innovation with each identifying different factors that need to be taken into account when measuring innovation in the PSOs.

3.6.2 Financial performance

The inconsistency in the studies only adds to further confusion on the measurement. Scholars (Canibano, Garcia-Ayuso & Sanchez, 2000:2) opine that measuring innovation accurately and assessing its effect on economic activity are likely to result in an improvement of the efficiency of resource allocation in an economy, both at the macro- and the micro-economic level. Canibano *et al.* (2000:2) further identified in their study the possible measures for innovation in the PSOs as financial reports and the amount invested in the intangible activities. Scholars (Ghazal & Zulkhibri, 2015:252; Ukko & Saunila, 2012:358) categorised intangible activities into three types: human capital, intellectual property, and organisational capital- and activities that generate intangible assets which feedback into the innovative process. For example, human capital represents the knowledge and skills possessed by individuals; intellectual property represents technical inputs to the innovation process; organisational capital refers to business model and processes, networks and alliances and special competencies of the firm, and marketing or design.

3.6.3 Intellectual property rights

However, critics (Saunila & Ukko, 2013:995) argue that this can be misleading since financial performance reports may not necessarily translate into organisational innovation. Hence, this cannot be used as an appropriate measure in this case. On the other hand, Ghazal and Zulkhibri's (2015:252) studies conducted in the public sector organisations identified innovation measurements as the number of new products, processes or services that have been implemented per 100 staff, the percentage of the projects that are co-funded, expected time to adoption versus actual time, sign-off strategic intent and output measures, case studies including cost benefit analysis, number of staff who played a critical role in the first adoption of an idea that is new to the world, or the sector, expenditure on innovation and innovation index based on three or four measures. Aizcorbe *et al.* (2009:12) state that microeconomic literature has not given rise to a paradigm that lends itself to measuring innovation and its impact on economic growth. This is because theorizing innovative activities at micro-level is difficult, since one process of innovation involves a complex set of economic actors and interactions that in principle require someone to take account of networks, linkages, and complementarities. However, the service sector innovation index (SSII) compiled by Arundel *et al.* (2007) identified innovation indicators as: human resources, innovation demand, public support for innovation, product and process innovation, products and process outputs, non-technological innovation, non-technological outputs, commercialisation and intellectual property.

3.7 BARRIERS TO PUBLIC SECTOR INNOVATION

The most recent studies (Albury, 2011; Khilji, Mroczkowski, & Assudani, 2012:266; Windrun, 2014) on PSOs have identified the most notable barriers to innovation as over-reliance on the exploitation of existing resources, Government failure in policy formulation, low literacy rates and weak higher educational systems, high risk in projects, culture of risk aversion, delivery pressures and administrative burdens, reluctance to close down failing programmes or organisations, poor skills in active risk or change management, no rewards or incentives to innovate or adopt innovation, technologies available but constraining cultural or

organisational arrangements, over-reliance on high performers as sources of innovation, short-term budgets and planning horizons, and bureaucratic culture.

3.7.1 Over-reliance on the exploitation of existing resources

The studies (Albury, 2011; Windrun, 2014) reveal that the public sector always over relies on the exploitation of existing resources thereby hampering their ability to think of other resources that could add value to the innovative process. This over-reliance acts as a constraint on the part of PSOs to explore other sources or means of doing things differently, in order to add value to the existing products and services due to the depletion of those existing resources over a long time (Agolla & Van Lill, 2013; Singh, Pathak, Naz & Belwal, 2010:261). The argument here is to encourage PSOs to continuously search for new resources out there and exploit them instead of over-reliance on what is known to them. In today's competitive society, the competitive advantage is grounded upon the ability of the organisations to exploit unique competencies and resources that are not easily accessible to their competitors (Agolla & Van Lill, 2013). These resources range from financial support to shortage of relevant skills or support services that may be needed for the implementation of innovation (Engida & Bardill, 2013:6; Khilji, Mroczkowski & Assudani, 2012:263). For example, it is well documented (Albury, 2011; Engida & Bardill, 2013:6) that PSOs have failed to attract and retain skilled personnel due to poor conditions of service. This has resulted in high labour turnover among the educated, skilled and experienced staff. Areas affected by such an exodus are health services, technical services, and scientific organisations just to mention a few. The gap created by this turnover has forced the PSOs to rely heavily on the already over-stretched staff that is demoralised (Engida & Bardill, 2013:6; Manzini, 2012:7). Apart from the over-reliance on the exploitation of existing resources, government failure in policy formulation that can enhance innovation capability has been a hindrance too.

3.7.2 Government failure in policy formulation

Studies (Fu & Xiong, 2011:213; Lankeu & Maket, 2012:268) argue that government's failure to formulate policies that can support innovation by continuous reforming and updating of the regulatory and institutional framework within which innovative activities take place act as a hindrance to innovation in the PSOs. Similarly, other scholars (Agolla & Van Lill, 2013; Lankeu & Maket, 2012:268; Sun *et al.*, 2013:368) posit that lack of an innovation-driven industrial policy, as the top macro-economic strategy for industrial development is likely to undermine the innovative process as well as industrial development. In addition, the absence in a country of a National Innovation System (NIS) can also be a barrier to innovation in the PSOs. Nelson and Rosenberg (1993) define a national innovation system (NIS) as a set of institutions whose interactions determine the innovative performance of PSOs (Tigabu, Berkhout & Beukering, 2015:333). As such, it is a system of interconnected PSOs and private sector organisations to create, store and transfer the knowledge, skills and artefacts which define new technologies (Tigabu, Berkhout & Beukering, 2015:333; Manzini, 2012:7). Studies (Oyelaran-Oyeyinka & Sampath, 2007; Sabir & Sabir, 2010:220) have also shown that some governments have fragmented industrial policies that only confuse the state of public sector innovation. This confusion is coupled with rigid laws and regulations, lack of political commitment or opposition, uncertainty about the political environment particularly in developing economies, for example Kenya (Lee, Hwang & Choi, 2012). Last, but not least, government failure in policy formulation that could spur innovation activities coupled with low literacy rates and weak education systems have hindered the public sector organisations' ability to innovate.

3.7.3 Low literacy rates and weak higher education systems

Countries with low literacy rates and weak higher education systems often face a great deal of difficulty in assimilating new technologies for innovation development as they lack the essential human capital to leverage technological developments, scientific knowledge and technical skills (Khilji, Mroczkowski, & Assudani, 2012:266). Scholars (Sabir & Sabir, 2010:220; Fu & Xiong, 2011:214) further add that inadequate

intellectual property rights (IPR) protection often creates a disincentive for organisations to engage in innovation development through research and development (R&D), as the economic spin-offs associated with their innovation efforts are diminished very quickly once made available in the public domain. There is no doubt that the education level of a country plays a significant role in the creativity of any nation. However, it should be noted that education alone would not make people creative and innovative without a good curriculum that can address the needs of today's organisations (Sun *et al.*, 2013:365). For example, if the curriculum does not address the sciences and mathematics that are very necessary for the assimilation of technology, then such education would not be helpful (Stankovic, 2013). In most developing countries, where resources (financial) are still lagging behind, it is difficult to invest enough in education, because they are faced with a myriad of problems such as raising the standard of living of the people through good health systems and provision of other infrastructures (Khilji, Mroczkowski, & Assudani, 2012:266). Therefore, sometimes funds that are allocated for education can be diverted into other pressing programmes. This contributes to the low level of basic education for the general population, leaving out higher education. Whereas there is enough evidence that investment in education at all levels is very important, there is little investment at the same levels. This is because these developing countries lack the necessary resources to meet all these demands with their budgetary constraints (Sanz-Valle, Naranjo-Valencia, Jiménez-Jiménez & Perez-Caballero, 2011).

On the other hand, developing countries are still struggling with the establishment of higher education since there is poor or low basic education at primary and secondary level, therefore only a limited number of students can get places at university. Another problem is that the education curriculum is too general with little emphasis on science subjects. It should be emphasised that, in the era of information technologies, it is the sciences that matter as drivers of an innovative society. Apart from low literacy rates and weak education systems, another barrier is found in the high risk in innovation projects. This is because innovation projects involve and require large amounts of capital to carry out.

3.7.4 High risk in projects

Innovation projects often involve high risks, long gestation periods and therefore require huge amounts of financial resources to share risks and costs. Hence, restrictive ownership policies on direct investments often hamper PSO participation in innovation projects (Ball, 2011:13). It is worth noting that the public sector works within budgetary constraints, and does not allow for losses in the name of experimenting on new projects or long-term projects with no immediate returns to the government and the general public (Albury, 2011:231). The public sector is large and complex in nature, and involved in huge projects with substantial amounts of investments that directly affect the general public (Ball, 2011; Sun *et al.*, 2013). Therefore, since innovation is associated with some degree of risk whose magnitude is not known, the managers of these public sector institutions would rather steer away from being innovative because such actions, if they fail, have dire consequences for their jobs (Agolla & Van Lill, 2013; Agolla & Van Lill, 2014). Hence, faced with these choices, innovation is discouraged in the public sector because of its consequences for the organisation and the general public (Ball, 2011). Apart from high risk projects and innovation activities, there is also a culture of risk aversion among the public sector managers due to possibilities of failure after heavily investing in such innovative projects. This has hindered PSOs from carryout innovative projects due to the risk involved and the consequences of miscalculated risk taking.

3.7.5 Culture of risk aversion

Scholars such as Mostafa, (2005:24) and Sangiorgi, (2015:343) have identified other barriers as risk aversion culture. This risk aversion culture is due to the obligation to maintain continuity, and need to provide acceptable standards in key services and accountability to tax payers through parliament and local authorities. The obligations above can induce a culture of risk aversion, which impedes or blocks innovation in the PSOs (Mulgan & Albury, 2003; Clark, Good & Simmonds, 2008). Public sector managers and politicians alike are very wary of enacting changes that may result in negative outcomes, particularly if there is the risk that this

may attract media attention (Agolla & Van Lill, 2013; Ball, 2011:12). This can create a scenario that may likely put PSOs in the limelight of public scrutiny and condemnation. Therefore, it is very common in the public sector to avoid anything that may have negative connotations such as risks that may come as a result of any changes in the organisation's operations (Agolla & Van Lill, 2013).

There is also a tendency towards blame culture, with its associated high levels of accountability. Added to this is the risk of litigation in the event of adverse impacts and events (Clark, Good & Simmonds, 2008; Mulgan & Albury, 2003). These features contribute to the broader notion of risk aversion among the PSOs managers as well as politicians. Given these scenarios, it would be only appropriate and logical for managers of these PSOs not to attempt anything that may attract the attention of both the media and the general public to whom they are accountable to (Petkovšek & Cankar, 2013:1331). Under these circumstances, how can PSOs meet the demands and challenges of our society? To answer this question, we ought to understand that, without reasonable risk, whether minimal or huge, the current challenges facing our society can only be addressed effectively through innovation (Albury, 2011; Windrun, 2014). Therefore, if the culture of risk taking is not entrenched in the PSOs, then there will be no innovation and these organisations will not deliver the much-needed services in the twenty first century to the general public. It is this risk aversion that hinders the PSO's capacity to innovate (Petkovšek & Cankar, 2013:1331). This risk aversion among PSOs has been exacerbated by factors such as delivery pressures and administrative burdens namely that managers and employees are preoccupied with meeting deadlines instead devoting time for creative thinking.

3.7.6 Delivery pressures and administrative burdens

Many studies (Agolla & Van Lill, 2013; Petkovšek & Cankar, 2013:1331) indicate that service managers and professionals spend the overwhelming proportion of their time dealing with the day-to-day pressures of delivering services, running their PSOs and reporting to senior managers, political leaders, agencies and inspectorates. This leaves them with little time to think about doing things differently or delivering services in ways that would alleviate the pressures and burdens (Petkovšek & Cankar, 2013:1331). Innovation is

nurtured and generated in an environment where there is room to think outside the box, however, in the case of the public sector, it is difficult to find time to think freely because most of the time employees are busy with meeting deadlines (Agolla & Van Lill, 2013). Even if there is room to think outside the box, the public sector never encourages employees to suggest new things that have not been tried successfully in the past (Agolla & Van Lill, 2013; Petkovšek & Cankar, 2013:1331. In other words, PSOs are more comfortable with the known as opposed to unknown ideas (Koch, Cunningham, Schwabsky & Hauknes, 2006). However, apart from delivery pressures and administrative burdens, it is difficult to find government closing down failing programmes, organisations or projects with the aim to revitalise them; instead the same old or failing programmes still get funding from the government.

3.7.7 Reluctance to close down failing programmes or organisations

In business, organisations need to innovate or die. It is unlikely that the PSOs will collapse due to lack of innovation. Governments rarely close down failing functions and tend to set much higher standards for new programmes than old ones (Fu & Xiong, 2011:204; Liu, 2011:244). The degree of innovation in public enterprises is negligible. In fact, in most cases the government never thinks of introducing new methods simply because the old methods have failed to yield good results (Agolla & Van Lill, 2013; Windrun & Koch, 2008). Instead, it keeps pouring in funds to continue with the same ways that have failed. The continuity in business and maintenance of the status quo just worsens the operations of the public sector more than improving them (Clark, Good & Simmonds, 2008). On the contrary, the private sector would not allow the continuity of the business without calling for radical change in the way things are done (Pekkarinen, Harnnala & Harmaakorpi, 2011:504). This is what makes the difference between the two sectors in terms of creativity and innovation. Even if the PSOs were to close down operations, it would take a long time since their functions are prescriptive under what is called legislative mandate (Agolla & Van Lill, 2013; Windrun & Koch, 2008). This not only makes PSOs to be inflexible to change, but also not to adapt to the changes in the external environment in order to survive (Koch, Cunningham, Schwabsky & Hauknes, 2006). On the other hand, it is argued that innovative organisations must always seek for change and opportunities to

exploit; instead changes are forced on the public sector (Mostafa & El-Masry, 2008; Wojtczuk-Turek & Turek, 2015). This type of behaviour is a hindrance to innovation in the public sector organisations. Although reluctance to close down failing programmes or organisations in public sector is a hindrance to innovation, but also a test that PSOs managers have poor skills in change management.

3.7.8 Poor skills in change management

It is argued that even where professionals and managers have the opportunity and motivation to innovate, a relative paucity of skills in change management and risk management can severely hinder or debilitate the innovation process (Agolla & Van Lill, 2013; Engida & Bardill, 2013:6; Lankeu & Maket, 2012:269). The public sector tends to be fearful of risk. However, the main challenge the public sector should concern itself with is how to manage risk, not eliminate it. Risk can be managed across a portfolio of projects that span the high return/high risk end, as well as medium and low return agendas (Murray, Gaulier-Grice & Mulgan, 2010). Murray *et al.* (2010) further add that a balanced view of risk is vital as some innovations spread too slowly, but others spread too fast, without adequate evaluation and assessment, particularly when they win the backing of leaders. A commitment of evaluation and evidence, and staged development of new approaches, help reduce risk (Murray, Gaulier-Grice & Mulgan, 2010). Furthermore, researchers (Engida & Bardill, 2013:6; Lankeu & Maket, 2012:269) state that, in the public sector sphere, where the tradition of past knowledge, experience, and conservative institutional solutions strongly influence managers' decisions, such resistance to creativity and change is widespread. Management attitudes towards change and their willingness to take risks is one such facet that may affect innovation. On the other hand, studies (Murray, Caulier-Grice & Mulgan, 2010:47), point out that a risk adverse mindset that is so typical of many state-controlled agencies reduces innovativeness, whereas a risk-oriented mindset enhances it. However, the real challenge is not the risk in itself, but how to manage it. Therefore, the failure to manage risk is what hinders the innovation capacity of these PSOs. This is because a majority of public sector managers are not able to take risks; they tend to fear risk-taking at all costs. Besides poor skills in change management identified to be a barrier to

PSOs innovativeness, the public sector suffers from inadequate rewards or no incentives to innovate or adopt innovation compared to the private sector.

3.7.9 No rewards or incentives to innovate or adopt innovation

The civil service has traditionally had higher penalties for failed innovation than rewards for successful ones. Moreover, the day-to-day business management and processes and the basic people management systems do not sufficiently recognise innovation, for example, in the core competencies for recruitment, development and performance assessment (Albury, 2011:228; Engida & Bardill, 2013:7; Lankeu & Maket, 2012:268). PSOs tend to be characterised as having few or no incentives. Workers tend to be less motivated because of the feeling that these are public organisations (Agolla & Van Lill, 2014; Lankeu & Maket, 2012:268). Innovation needs to be supported by adequate incentives, or at least not blocked by disincentives. Rewards can take any form from recognition, promotion, or finance (Murray, Gaulier-Grice & Mulgan, 2010). However, sometimes the reward systems in the PSOs are very difficult to administer effectively due to the fact that rewards are not performance-based compared to the private sector where such rewards are matched to individual performance or contributions to the organisation. Therefore, because of this disparity, PSOs constantly lose skilled manpower to the private sector leaving them with only less educated, skilled and experienced personnel (Khabusi, 1997; Nour, 2013:13). Therefore, most PSOs are left with employees perceived to be non-performers. This is because high performers will naturally be attracted to the private sectors that are ready to offer better rewards for such skills (Khabusi, 1997).

It is revealed that creativity, which is the seedbed for innovation, comes from committed employees who are capable to exploit and use their skills to the fullest (Eriksson, 2014:163). However, for them to be creative, employees require adequate incentives in any form. It is this incentive that is lacking and acts as a hindrance to employees' creativity and innovativeness. The incentive to innovate is what makes the private sector shine as compared to the public sector (Lee, Hwang & Choi, 2012).

Public sector organisations are government funded through legislative appropriation, that is, government subvention. PSOs operate within a budget line as passed through the parliament to implement government policies and programmes that creates an over-reliance on one source of revenue. There are no venture capitals to fund PSOs innovation activities. This means PSOs have to operate within limited budgets for specific projects as imposed by the government. The salary system in the PSOs is fixed with minimal linkage between productivity or innovation and compensation (Vigoda-Gadot *et al.*, 2005). The public sector organisations have failed to institutionalise innovation-related pay such as team and personal performance bonuses linked to innovation. All these have been suggested, but still are difficult to operationalise therefore making rewards difficult to link to a group or a person responsible for innovation or ideas in the organisation (Carstensen & Bason, 2012:3). Rewards and incentives are not the only barriers to innovation, but there are also other factors such as fear or techno-phobia or organisational arrangements that hinder PSOs from innovation as discussed in the following sub-section.

3.7.10 Techno-phobia or organisational arrangements

Innovation results from a combination of technological and organisational factors, for example, improving customer service may involve the use of information technology, training, and organisational change (Johannessen, 2013:1199). Therefore systematic innovation only comes about when organisations develop the appropriate alignment of culture, systems, management methods and processes to embed innovation in the fabric of the PSOs (Johannessen, 2013:1199). It is worth noting that application of technology to PSOs is never without a fight. This is because the characteristics of PSOs warrant such. The general perception among employees and even politicians is that PSOs are welfare organisations that should be seen to be championing the interest of the masses. Application of technologies is seen as replacing the workforce with machines (Mulgan & Albury, 2003; Clark, Good & Simmonds, 2008). Therefore, such a move is always reluctantly welcomed despite the gains that the technologies may bring to the organisation. Whereas there is agreement that application of technologies can create more employment through spillovers, its acceptance among the PSOs is yet to be seen (Mulgan & Albury, 2003; Clark, Good & Simmonds, 2008). Innovative

organisations are always ready to embrace new technologies as a cutting edge particularly in the private sector, which is why they are able to produce innovative products and services as compared to the public sector (Albury, 2011).

Another problem that makes the application of technologies difficult is the culture in the public sector of the maintenance of the status quo even when things don't work at all. The bureaucratic arrangements of these organisations make it more difficult to allow the introduction of new technologies particularly if they perceived to disrupt the routine of the organisation (Windrun & Koch, 2008). The structure is so complex and large in size, that the application of technologies causes massive disruption of the operations and even result in lay-offs of a sizeable number of employees (Windrun & Koch, 2008). However, faced with this dilemma, both managers and politicians alike would never allow any rationalisation, since this will be seen as being insensitive to the plight of the employees and the general public (Windrun & Koch, 2008). Last, but not least, the lack of scientists or employees with technological know-how, particularly in developing countries is another contributing factor (IdeA Knowledge, 2005). This is because such employees are offered better remuneration in the private sector or are lured by the developed world where they are well paid (Windrun, 2014:). Again, developing countries' ability to absorb scientists and engineers is limited due to their early stage of development. These factors constrain the public sector organisations' abilities to innovate, as they have to rely heavily on the methods of production using out-dated technologies. Despite techno-phobia among PSOs managers, another problem that confronts most public sector organisations is inability to produce long –term budgets and planning as opposed to short-term budgets and planning horizons.

3.7.11 Short–term budgets and planning horizons

The studies by Clark, Good and Simmonds (2008), and Sangiorgi, (2015:343) suggest that short-term budgets and planning horizons within the public sector organisations also hinder their ability to carry out successful innovation. The short-term budgets and planning horizons have, as a result created operational pressures on the PSOs, when only a few innovative businesses would survive an obligation to break even every year

(Mulgan & Albury, 2003). Inadequate planning and lack of feasibility studies resulting in ill-conceived investments and impossibility of bankruptcy because of support from the government are factors that hinder innovation in the PSOs (Khabusi, 1997). There is enough evidence that most PSOs operate under short-term objectives that cannot facilitate innovation (Murray, Gaulier-Grice & Mulgan, 2010). For PSOs to cultivate innovation, the focus on long-term plans should be the norm as opposed to reacting to the events in the short-term (Murray, Gaulier-Grice & Mulgan, 2010). Therefore, in order to gain from innovation, PSOs must have long-term plans that will allow the ideas generated to mature into commercially viable products or services. Another barrier to innovation in the public sector is the bureaucratic culture that is quite elaborate and cumbersome when it comes to decision-making and taking decisive actions.

3.7.12 Bureaucratic culture

Modern bureaucracies were designed to stop unfair, unpredictable and arbitrary actions by those in charge of the PSOs (Pekkarinen, Hennala & Harmaakorpi, 2011:521). They do this by imposing rules: systematising, formalising, specifying how things should be done and ensuring uniformity (Pekkarinen, Hennala & Harmaakorpi, 2011:520). Not surprisingly, innovation does not flourish in such an environment, because innovation requires employees to have some degree of freedom and a free mind that can generate ideas (Amabile *et al.*, 1998). This also applies to PSOs and local government with a tighter prescription of how services should be run and what they should seek to achieve that tends to reduce the scope for local experimentation (Mulgan & Albury, 2003; Clark, Good & Simmonds, 2008). Managerial attitudes toward innovation and the organisational climate are some of the barriers that have been identified in the public sector (Kalsi & Kiran, 2013:333). It must be noted that most PSOs are embedded and are large; they pose challenges to the managers in terms of coordinating the activities of these organisations. It is also common to find that bureaucracies in the PSOs are more comfortable with the conservative work patterns (Khilji, Mroczkowski, & Assudani, 2012:266; Pekkarinen, Hennala & Harmaakorpi, 2011:521). They tend to follow strict rules, methods and procedures that have long been proven to work reasonably well in the past (Vigoda-Gadot *et al.*, 2005:58). Hence, PSOs are reluctant to replace strict rules, methods and procedures with new,

unconventional techniques and ideas that may seem risky or complicated (Vigoda-Gadot *et al.*, 2005:58). Bureaucracy may have brilliant and good ideas, but due to their lethargy, ideas never go beyond the conceptualisation stage; sometimes they get delayed or even worse vanish, because of lack of adjustment to the organisation environment (Kalsi & Kiran, 2013:333; Pekkarinen, Hennala & Harmaakorpi, 2011:521). Vigoda-Gadot *et al.* (2005) further state that bureaucracy relies on old organisational models (traditional), which emphasise vertical communication channels, compliance, order and control rather than on new ones that respect creativity, commitment, the mixed flow of communication, autonomy and responsibility.

The evidence (O'Sullivan & Dooley, 2009:43) suggests that excessive hierarchy is a barrier to innovation when decisions and ideas need to follow vertical paths through the decision-making hierarchy as commonly found within the public sector. On the other hand, flat organisations such as the private sector, where most organisations accept ideas from all sources that are judged on merit are supportive of innovative activities. Excessive hierarchy stifles innovation and slows the necessary innovation that sustains growth. Public sector organisations are known to have a mechanistic sort of structure, which only facilitates functional silos and poor communication, both of which can inhibit collaboration and creativity (Kalsi & Kiran, 2013:333). Similarly, researchers (Agolla & Van Lill, 2013; Lankeu and Maket, 2012:266) identified barriers within PSOs as the size and complexity of a large-scale organisational entity which is composed of multiple tiered interlinked systems; high staff numbers, a large range of professional, semi-professional and ancillary occupations, and a diversity of organisational arrangements and service processes.

In the foregoing sub-sections the study discussed the drivers and barriers to innovation in the public sector. In the following sub-sections, the focus will be on the strategies that public sector managers need to put in place to overcome barriers to innovation.

3.8. STRATEGIES TO OVERCOME BARRIERS TO PUBLIC SECTOR INNOVATION

In previous sub-sections, the study discussed barriers to innovation in the public sector organisations. However, in this section, the focus of the study is on strategies to overcome barriers to innovation in the

public sector organisations. The public sector is faced with a myriad of challenges that have hindered their abilities to innovate as compared with the private sector. Some of these challenges (barriers) can only be overcome through the combination of the following factors such as availability of material resources, intangible organisational resources, creation of innovation funds, appropriate reward systems, appropriate innovation policies, learning organisation and training, and transformational and strategic leadership. These factors are discussed in subsequent paragraphs as follow.

3.8.1 Transformational and strategic leadership

Transformational leadership can be conceptualised as the process by which leaders bring about organisational change by raising the level of motivation of followers (Valero, Jung & Andrew, 2015:6; Van Wart, 2013). Transformational leadership emphasises personal relationships and development, teamwork, communication, autonomy and creativity, integrity, and empowering culture, honesty, humility and generosity, and continuous learning (Nusair, Ababneh & Bae, 2012; Spicker, 2012:38). Studies (Agolla & Van Lill, 2013; Engida & Bardill, 2013:7; Lankeu & Maket, 2012:269; Spicker, 2012:35) on transformational leadership refer to behaviours of leaders who motivate followers to perform and identify with organisational goals and interests and who have the capacity to motivate employees beyond expected levels of work performance. Innovation is known to thrive in a democratic culture in which ideas can openly be aired, debated and tested (Spicker, 2012:42). However, in most developing countries, this democratic culture has been missing. Mostafa (2005:24) and Nusair, Ababneh and Bae (2012:185) argue that, in order to overcome barriers to innovation in the PSOs, employees must be encouraged to engage in risk-taking and PSOs must allow some degree of tolerance for mistakes.

Transformational leadership has been identified as a means to facilitate creative and innovative behaviours amongst employees (Hu, Gu, & Chen, 2013:162). Other factors are availability of material, financial and human resources (Laforet, 2011:383). Innovation requires leadership that is both transformational and strategic at the same time. The transformational leader helps group members understand the need for change

both emotionally and intellectually (Nusair, Ababneh & Bae, 2012:185; Spicker, 2012:37), while strategic leadership on the other hand, sets a clear organisational vision and strategic direction to the members. On the one hand, studies (Agbor, 2008:41; Nusair, Ababneh & Bae, 2012:183) state that organisations need creative and effective leadership to manage the implementation of the strategy and encourage innovation in the organisation. To innovate, PSOs need leadership with the abilities of flexibility, adaptability, speed, and experimentation. This is because innovation takes place in an environment that requires quick response to changes and faster adaptability in order to remain competitive. They need leadership that influences followers, empowers, allows for continuous change and recognises individual as well as group efforts (Spicker, 2012:43).

On the other hand, organisations that are innovative go for change to improve their performance, hence they tend to use strategic leadership to achieve both innovative direction and innovative potential (Loewenberger, Newton & Wick, 2014:197; Spicker, 2012:43). Leadership dimensions found related to the innovation strategy possess the following qualities: divergent thinking, critical thinking, technological skills, problem solving, analytical skills, strategic thinking and numerical abilities (Spiker, 2012:40; Hu, Gu & Chen, 2013:162). The above cognitive competencies are found to be strongly linked to the innovative and change management capacity of public sector managers. However, although these leadership dimensions that have been identified tend to be highly visible among Chief Executives of the private sector, the same is yet to be seen among their counterparts in the public sector organisations (Agolla & Van Lill, 2013; Spicker, 2012:37). However, it should be noted that having transformational leadership alone without innovation policies in place would be difficult to overcome the aforementioned barriers to innovation in the public sector organisations.

3.8.2 Innovation policies

In the previous sub-section, the study explored the role of transformational leadership in overcoming barriers to innovation, however studies (Agolla & Van Lill, 2013;Conteh, 2012:470) have demonstrated that, without

friendly innovation policies in place, to overcome barriers to innovation would remain a pipe dream. Governance policies towards innovation are important as they can enhance or hinder innovation in the public sector organisations. Innovation in the PSOs often requires efforts from many ministries and government agencies, and from national and sub-national levels (Conteh, 2012:465; Hilgers & Ihl, 2010:73; Windrun, 2014:1047); in addition, strong political leadership and efforts to develop a clear understanding by the various stakeholders of the problems and of the solutions (including the costs involved) can all help to communicate the need for reform and foster acceptance (Conteh, 2012:470).

Earlier studies (Bloch, 2011:3-4; Carstensen & Bason, 2012:3; Paraskevopoulou, 2012) have indicated that a comprehensive innovation-friendly policy helps overcome the barriers to innovation in the public sector. Alternatively, unfriendly policies have been found to be barriers to innovation (Conteh, 2012:467). Therefore, to strike a balance, since government plays both a direct and indirect role in the operation of the PSOs, it should formulate industrial policies that place a greater emphasis on innovation. Policies alone are not enough if there is no political will to support such innovation policies (Conteh, 2012:467). It is very common in developing countries for the politicians to formulate policies but to fail to implement them in the end (Carstensen & Bason, 2012:3). Innovation policies should be supported irrespective of the political ideology of political parties in order to accelerate the rate of public sector innovation (Carstensen & Bason, 2012:3; Paraskevopoulou, 2012).

Developing and implementing policies to encourage science, technology and innovation in the presence of market or systematic failure, such as provision of financial support for research and development can go a long way in driving innovation in the public sector (Ball, 2011:13; Conteh, 2012:467). The argument here is that policies play vital roles since they can hinder or facilitate innovation in the public sector because PSOs operate within legislative frameworks that dictate how the sector operates (Carstensen & Bason, 2012:3; Expert Group on Public Sector Innovation, 2013:16). Policies that are framed to encourage employees to take risks, be creative and have freedom to experiment with ideas will naturally, if well supported with the right organisational leadership result in innovative activities (Bloch, 2011:3-4; Rivera León, Simmonds & Roman,

2012:16). However, notwithstanding the importance of innovation policies as a critical factor to overcoming barriers to innovation, another factor is the ability to create learning public sector organisations. Learning public sector organisations, whose members are always receptive to new things, learn new ideas and put them into perspective to the benefit of the organisation and the citizens.

3.8.3 Learning organisation

In the previous sub-section, the study investigated the importance of innovation policies in overcoming barriers to innovation, and how the public sector can capitalise on the creation of policies that foster innovation. In this sub-section, the study analyses the learning organisations based on the extant literature. Organisation learning refers to sets of practices useful to organisations in developing the ability to learn and to know how they learn (Mele, Spena & Colurcio, 2010:76). Organisation learning also implies the freedom to take risks, to practise and experiment, and to make mistakes (Moustaghfir & Schuima, 2013:499). This is because learning is fundamental to finding innovation potential. Whereas learning is seen as the fundamental to finding innovation potential, this has not been the case with the PSOs. However, it should be noted that most PSOs are not accustomed to continuous learning. This is because continuous learning is associated with disruption of operations, hence PSOs employees are always pre-occupied with policy implementation and how to maintain procedures that have worked so well in the past instead of trying new things altogether (Murray, Gaulier-Grice & Mulgan, 2010). Therefore, training is more of maintaining the status quo as opposed to learning new things that require improvements in outcomes (Engida & Bardill, 2013:7; Lankeu & Maket, 2012: 270). PSOs should invest in the areas of strategic thinking, creativity and innovation that are critical to the organisation's success as they are fundamental functional skills (Fryer, Ogden & Anthony, 2013:487). It is this investment in the area of strategic thinking that will pay off when members of the organisation are able to recognise causal relationships between their assumptions or actions and the behaviour of the customers (public). Organisation learning is the source of creativity and innovation (Fryer, Ogden & Anthony, 2013:488; Belkahla & Triki, 2011:654).

In learning organisations, individual and collective learning processes can be distinguished; the quality of a learning organisation is apparent when individuals have an impact on one another. In fact it is these mutual processes of interactions that lead to behavioural changes, (mostly in the form of scripts or collective routines) leading to innovation learning which is the power of the learning organisation (Lee, Olson & Trimi, 2012:829). Similar studies (Rivers, 2001; Isaacson & Fujita, 2006) posit that metacognition, that empowers learners with a self-regulated learning mechanism, is the best learning strategy. The argument here is that the focus of a learning organisation is to improve the potential of the individual employees in terms of metacognitive learning. Albury (2011) adds that creative ideas can arise from anywhere, at any time, but if managers seek to harness creative individuals to foster innovation, they should not only provide PSOs with a structure in which innovative ideas are encouraged to appear, but also to ensure that an appropriate reward system is in place so that they continue to emerge.

3.8.4 Appropriate reward systems

In the previous sub-section, the study focused on the learning organisation as an organisation where the members are encouraged to learn new things, where new ideas are generated, experimented with and continuous learning is made part of the daily lives of the entire organisation. However, as much there is a case for a learning organisation, one thing that public sector organisations must act on is the motivation and reinforcement of what has to be learnt and has been learnt in order to create sustainable learning organisations. This calls for effective reward and remuneration systems in place; without it perhaps it will not be possible to create a learning organisation. The public sector reward systems have not been attractive to enable them to retain their valued staff as compared to the private sector (Abury, 2011; Lankeu & Maket, 2012:269). Research indicates that appropriate reward systems will not only attract and retain the qualified staff but would go a long way in motivating them to perform to their best ability (Gatere, Keraro & Gakure, 2013:1021; Lankeu & Maket, 2012:269). Innovation ideas bring value to the organisation, therefore PSOs managers need to align the reward systems with the individual and group performance so that those employees are rewarded adequately for their personal contribution towards creativity and innovation. Engida

& Bardill, (2013:6), Gatere, Keraro & Gakure, (2013:1021); Hope, (2012:132); and Lankeu & Maket, (2012:269) identified rewards as drivers to innovation and suggest that for the public sector to innovate their reward systems should be competitive not only to attract and retain their most valued employees, but also encourage employees to be creative and innovative. Besides the rewards systems in place, the organisation must strive for availability of other material resources that are also very crucial and critical for fostering innovation. In the subsequent sub-section, the study analyses the material resources and their impact on the organisation's ability to promote innovation.

3.8.5 Availability of material resources

Organisational success does not solely depends on how well rewarded its employees are, but how the organisation complements these rewards with material resources to enable employees to experiment and research for new products, services, or processes with the aim to create unique values to the organisation. The evidence (Agolla & Van Lill, 2013; Carstensen & Bason, 2012) suggests that innovation requires substantial investment in resources in order to carry out research before the actual innovative outcomes. These material resources range from financial, physical resources, infrastructure, and raw materials as inputs to the service process (Agolla & Van Lill, 2013; Conteh, 2012:470; Liu, 2011:253;). Innovation requires trying new ideas that have never been tried or tested before, and carries with them huge risks in terms of the resources invested (Albury, 2011; Mulgan & Albury, 2003). It is these resources that the government needs to provide to PSOs in order for them to carryout innovation activities (Mele, Spena & Colurcio, 2010:76). The failure of such risk-taking may mean substantial financial loss or closure of the entire project, but that should not limit the support from the government since there is no innovation without any risk taking or losses (Natáro, Couto & de Almeida, 2012:37). There should be a balance between risk taking and risk management in order to bring risks within manageable levels. This is what ought to be done in order to promote innovation and eliminate the fear of risk-taking in the PSOs. Employees require materials for the purposes of experimenting, research or trying new methods of services that have not been tried or tested before, therefore they need assurance that if such projects fail, then they will not be punished. Instead, mistakes or failure should offer a learning

opportunity for further development (Murray *et al.*, 2010). An example of how to deal with such mistakes or heavy losses, both in terms of material and human resources can be drawn from the National Aeronautics and Space Administration (NASA). The National Aeronautics and Space Administration is a United States agency that has received constant funding from the government of the United States in their quest to try out new things despite encountering heavy losses in terms of material and human resources. This is a typical example of how government support is required in the face of adversity.

Developing countries also can borrow from experiences such as those of the USA, and provide resources to PSOs, train employees in risk management and experiment with the limited resources at their disposal in order to promote innovation (Andriopoulos & Dawson, 2010). Studies (Agolla & Van Lill, 2013; Andriopoulos & Dawson, 2010) have indicated that material resources are always inadequate, and therefore there is a need to create innovation funds that would be dedicated to innovative ventures separate from other resources that the organisation might have in its disposal. This will enhance the accountability and transparency in dealing with such funds, which might be diverted to another use other than what they are created for, that is innovation funds.

3.8.6 Creation of innovation funds

Innovation requires substantial resources to carry out and to sustain (Albury, 2011; Windrun, 2014). Therefore, to foster innovation in the public sector, there should be an innovation fund that is dedicated to PSOs for the purposes of innovation activities. This fund should be well differentiated from other venture funds so that PSOs can carry out their operational activities (Agolla & Van Lill, 2013). For example, some countries have already created innovation funds as a way to carry out innovation activities. For instance, Finland (Finland's Innovation Funds), and India (National Innovation Funds) are some countries that have realised the importance of innovation (Murray *et al.*, 2010). On the other hand, stable macroeconomic conditions and low real interest rates have been found to encourage the growth of innovation activities by creating a stable and low-cost environment for investments in innovation (OECD, 2010). Others include the

availability of internal and external finance; an expansion in public research, which can support business sector research; and direct support to business innovation in the form of competitive grants or subsidised or guaranteed loans (OECD, 2010). The aforementioned factors are what is lacking in the PSOs and hinder their abilities to innovate. Alternatively if the government cannot support or create innovation funds, then there should be a way to provide financial support of any kind in order to promote innovation activities in the public sector organisations (Ball, 2011; Liu, 2011:253). In the following subsection, the summary of the Chapter 3 is presented with highlights on major points from the reviewed literature.

3.9 SUMMARY

The chapter dealt with the in-depth review of relevant literature on public sector innovation. The literature reviewed suggested that innovation in the public sector organisations is driven and fostered by a number of factors working in unison. The literature places emphasis on the drivers as: organisation strategy, innovation-friendly policies, entrepreneurship, organisation leadership, organisation culture, customers (citizens demand for quality services), suppliers, government legal framework, social, economics, technologies, partnerships and networking. These elements are the main drivers to innovation in the public sector organisations, which PSOs need to nurture and foster in order to provide quality services that can meet citizens' demand. It is argued that PSOs must adopt appropriate techniques that were formerly in the domain of the private sector as a way to solve the societal problems such as: hunger and famine, education issues, regional development, improved standard of living, health issues, employment, quality infrastructure and security issues. In the context of Kenya's PSOs, an innovative public sector could address current problems that were identified in chapter 1, the background of the study, and what was then captured in the SWOT analysis of the surveyed organisations.

The barriers to innovation in the public sector as presented in the review, and the SWOT analysis of the surveyed organisations arise from a lack of clear innovation policy, political patronage, inadequate funding, shortage of skilled human resources, bureaucracy, inadequate reward systems amongst others, which have

hindered innovation activities in the public sector organisations. Whereas some of the barriers were seen as necessary for innovation to take place, others were complete barriers to innovation in the public sector organisations. These complete barriers are: lack of organisation resources, unfriendly innovation legal framework, and inadequate reward systems amongst others.

To overcome the barriers presented in the chapters 1, 2 and 3, the literature points out that public sector organisations should adopt strategies such as: transforming into a learning organisation, transforming into an entrepreneurial organisation, adoption and formulation of appropriate innovation policies, removal of bureaucracy, provision of adequate resources, and creation innovation funds amongst others.

Lastly, the related literature on innovation in the public sector organisations indicated that, for the public sector to measure their innovation outputs, they should be clear of what to use as a measure of such innovative endeavours. The literature suggested public sector innovation outcomes as follow: increase in the level of standard of living, increased revenues, amount of expenditure on R&D, and customer satisfaction amongst others. As pointed out in the reviewed literature, the assessment of innovation in the public sector is still a problem as countries differ so much in what the indicators for such innovation outputs should. In the context of the present study, it was not clear in the reviewed literature on the innovation indicators / measures that are used in Kenya's public sector organisations.

In the following chapter, the methodology, research design, participants, sampling methods, instrument, and data analysis are discussed.

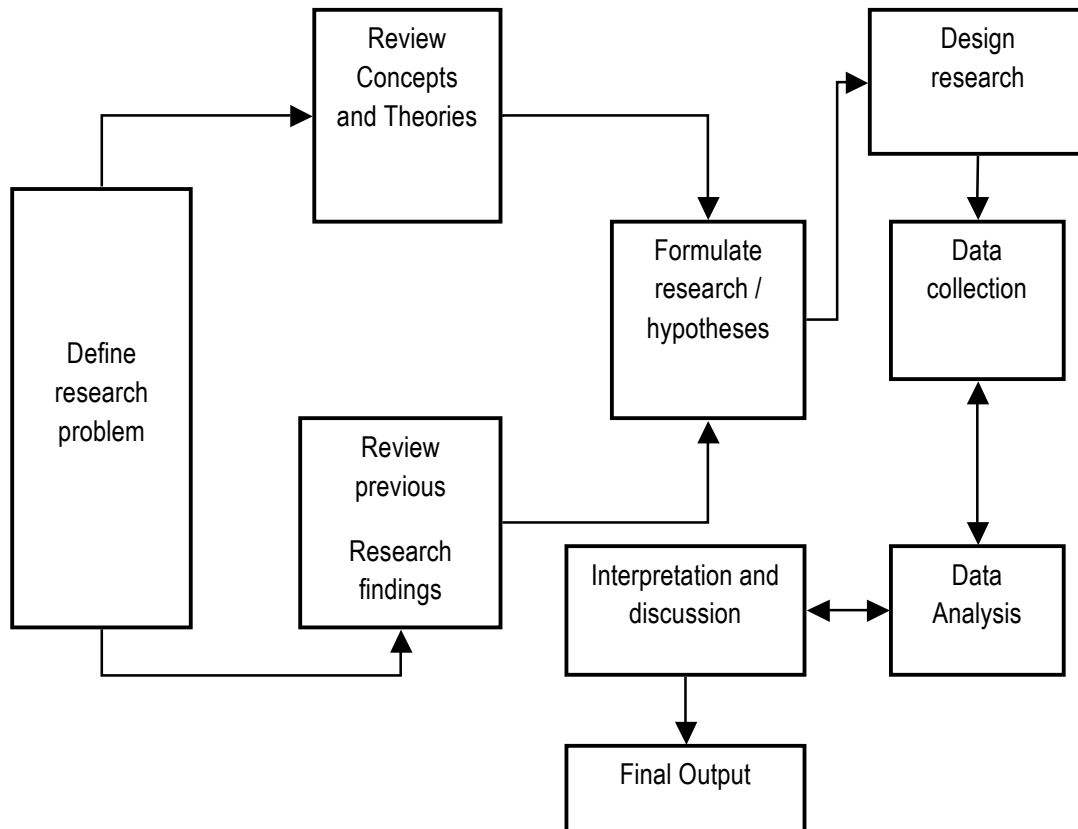
CHAPTER 4 METHODS

4.1 INTRODUCTION

In the previous Chapters, the literature concerning concepts and theories of public sector innovation were reviewed. A conceptual model was developed from the preliminary literature review to guide the present study. The detailed methods applied for this research are described under different sub-topics. The present chapter highlights data collection, organisation and evaluation, making deductions and reaching conclusions, and lastly, carefully testing the conclusions to determine whether they fit the formulated research questions (Johnston, 2014:209). In addition, the chapter includes sections describing participants of the study, study variables, measurement instruments, and research procedures for carrying out the present study. The present research applied the research process as indicated in Figure 4.1. The adoption of this research theory has advantage since it offers the researcher useful procedural guidelines regarding the research process (Raich, Müller & Abfalter, 2014:739).

The focus of the present study was to assess innovation in the public sector organisations in Kenya. Specifically, the study aimed at identifying and exploring various variables that drive innovation, barriers to innovation, overcoming barriers to innovation and innovation indicators/outcomes in the public sector organisations (PSOs) in Kenya, and to develop a framework specific to the Kenyan socio-economic and political environment.

Figure 4.8 Research study process flow chart



Source: (Agolla, 2013)

4.2 RESEARCH DESIGN

The purpose of research design is to facilitate research to be as efficient as possible yielding maximal information. In other words, the purpose is to provide for the collections of relevant evidence with minimal expenditure of effort, time and money (Modell, 2015:1143). Strategic choice of design assists with an

approach that allows for solving the research problem in the best possible way within given constraints (Modell, 2015:1143).

The present study employed a survey design to collect the data. Survey is usually a popular and common strategy used in business and management research. Survey design is perceived as authoritative by most researchers and is comparatively easy to explain and to understand (De Loo & Lowe, 2011:25). The research design constitutes the blueprint for the collection, measurement, and analysis of data. The present research is based on a survey of some selected organisations namely, the Ministry of Regional Development Authorities (MORDAs) based in Nairobi, Kerio-Valley Development Authority (KVDA) based in Eldoret, and Lake Basin Development Authority (LBDA) based in Kisumu.

The rationale for the choice of the three organisations was informed by the legislative mandate that created them. The first mandate was that these organisations were supposed to spur economic development in these regions. Secondly, their mandate was to create employment opportunities for the local population and the nation at large. Thirdly, these were to act as catalysts for poverty eradication among the population in these regions where they operated. Therefore, they presented an interesting avenue for the present study, since innovation is seen as both essential for economic development and the creation of employment opportunities.

Research data collection methods are broadly categorised into two: qualitative and quantitative methods (Modell, 2015:1143). Qualitative methods are concerned with motivations and behaviours of people at their work place, while quantitative methods are more appropriate in descriptive research where much emphasis is on application of basic statistical techniques to collect, analyse, and present data (Modell, 2015:1143). The present study applied triangulation approaches to data collection and analysis based on the nature of the predetermined research questions and objectives.

4.2.1 Participants of the study

The population of the study comprised the Ministry of Regional and Development Authorities, Lake Basin Development Authority and Kerio-Valley Development Authority all in Kenya. In terms of the population, the Ministry's human resources stood at 187 employees, while Lake Basin Development Authority (LBDA) had 125 and KERIO-Valley Development Authority (KVDA) 225 full-time employees respectively. The survey was conducted from 1 June 2012 to 5 July 2012. A total of 400 questionnaires were distributed to the participants. They were distributed by the researcher and later collected at an agreed date. Of the 400 questionnaires administered, 230 questionnaires were completed and returned giving a return rate of 57.5%. However, during the input of data into the computer for the analysis, the researcher noticed that some had missing data and had to be excluded from the analysis. The exclusion of missing data impacted negatively on the data for the present study. A total of 186 data after the refinement were found fit for the present study analyses.

4.2.2 Previous SEM studies and sample size

It is important before performing SEM analysis to check whether the optimal sample sizes are violated, and if possible remedial action be taken to ensure such studies remain valid in term of statistics, and sample sizes recommended. Therefore, the present study presents samples of the previous popular SEM papers and their corresponding fit indices in support of the sample size employed herein as indicated in Table 4.1 below.

Table 4.1 Previous SEM studies and sample sizes

Authors	Dtp	SESy	EM	Norm Ass	US	Fit Indices Reported
Hughes & Kwon, 1990	CS	MG	Ns	N	170	Chi-square
Gregson, 1992	CS	AM	Ns	N	150/232	Chi-square, GFI, AGFI, NFI, PFI, TLI
Collins <i>et al.</i> , 1995	CS	SC	Ns	N	172	Chi-square, GFI, AGFI, NFI
Magner <i>et al.</i> , 1996	CS	SC	MLE	N	95	Chi-square, CFI
Collins <i>et al.</i> , 1997	CS	SC	MG	N	128	Chi-square, RMSR, NFI, NNFI, GFI, AGFI
Choo & Tan, 1997	CS	AM	Ns	N	110	Chi-square, AGFI, GFI
Van der Stede, 2000	CS	SC	MLE	Y	153	Chi-square, RMSEA, CFI
Chalos & Poon, 2000	CS	SC	MLE	Y	55	Chi-square, RFI, NFI
Fogarty <i>et al.</i> , 2000	CS	AM	Ns	N	188	Chi-square, RMSEA, AOSR, RMSR, GFI, NFI, NNFI, GFI
Abernethy & Lillis, 2001	CS	MG	Ns	N	56	Chi-square, NFI, GFI
Van der Stede, 2001	CS	SC	MLE	Y	153	Chi-square, CFI, RMSEA

KEYS: CS= Cross-section; AM = Alternative Models; Ns= Not specified; MG= Model generating; RMSEA = root mean square error; MLE = Maximum likelihood estimation; SC = Strict Confirmatory; N= Nominal; Y = Ordinal; AGFI= Adjusted Goodness of Fit Index; CFI = Comparative Factor Index; GFI = Goodness of Fit Index; RMSR= Root Mean Squares Residual; TLI = Tucker-Lewis Index; NNFI= Non-Normed Fit Index; PFI= Parsimonious Fit Index; NFI= Normed Fit Index; RFI= Root Fit Index; Dtp= Data Type; SESY= SEM Strategies; EM = Estimation Method; Norm Ass= Normality Assessed; US =Used sample.

From the above Table 4.1, despite the challenges experienced with regard to the population in this study, the present sample size is supported by earlier studies. Therefore, a sample size of 186 was considered as

adequate in meeting population representativeness and fit for SEM application (Iacobucci, 2010;Yoon & Uysal, 2005).

The subsections detail the participants' demographic characteristics as shown from Tables 4.2. In Table 4.2, the participants' gender, educational qualifications, work experience, positions, and age composition is summarised as indicated.

Table 4.2: Demographic characteristics of participants

Variables	Characteristics	Frequency	Percentage
Gender	Male	100	53.8
	Female	83	44.6
	Missing	3	1.6
Qualification levels	Diploma	81	43.5
	Bachelors	67	36.0
	Masters	25	13.4
	Missing	13	7.0
Positions	Senior Management	23	12.4
	Middle Management	66	35.5
	Lower Management	43	23.1
	Employees	44	23.7
	Missing	9	4.8
Age	20-29 years	29	15.6
	30-39 years	63	33.9
	40-49 years	52	28.0
	50 years and above	25	13.4
	Missing	17	9.1
Work experience	0-4 years	101	54.1
	5-9 years	34	18.3
	10-14 years	33	17.7
	15 years and above	14	7.5

Note: N= 186

The gender distribution of the sample was relatively even with 44.6% females and 53.8% males (see Table 4.2). The 30 - 39 years age group was the largest (33.9%), while 44.4% of

the participants were 40 years and older (see Table 1), which meant that most of the participants were relatively old. Participants were well qualified with the majority holders of diplomas, followed by those with Bachelor degrees (see Table 1). Participants were relatively evenly distributed among the levels of management and, as expected, senior managers were in the minority (12.4%) (see Table 1). However, one would have expected the percentage of participating employees (23.7%) to be higher (see Table 1). Most of the participants had little work experience with the current organisation (54.3% had less than 5 years) with 19.9% veterans who had 10 years and above (see Table 1).

4.2.3 Sampling frame

A list of all Kenyan state corporations (PSOs) was first obtained from the Inspector General of State Corporations office based in Nairobi. The list consisted of 262 state corporations. Of interest to the present study were three PSOs namely, the Ministry of Regional Development Authority, the Lake Basin Development Authority and KERIO Valley Development Authority. These were purposively sampled because their mandate was to spur economic development, create employment opportunities and alleviate poverty in particular regions where they are operating (MORDAs, 2008-2012). Hence, these selected PSOs were appropriate for the purpose of the current study purpose.

The rationale for choice of purposive sampling procedure was first informed by the following points: First purposive sampling was preferred to other procedures since it is much easier and minimises bias (Malina, Nørreklit & Selto, 2011:67). Second, the rationale for the application of this procedure was informed by the qualities the informant possesses. Thirdly, purposive technique also provides robust and reliable data (Malina, Nørreklit & Selto, 2011:67; Tongco, 2007:153). Purposive sampling is more appropriate when the study is mixed methods and triangulation based approaches, hence applicability in this case. The quality of any research does not only depend on the appropriateness of methodology and instrumentation used, but also

on the suitability of the sampling strategy adopted (Malina, Nørreklit & Selto, 2011:67; Saunders *et al.*, 2013). The sampling procedure adopted in the current study addressed the following key areas: the sample size in terms of the population of the study and the representativeness and parameters of the sample, in order to optimise the quality of the study results. The first stratum consisted of the policy-makers at the selected public sector organisation based at the Ministry of Regional Development Authority, Management of the PSOs, and lastly, the general employees of the selected PSOs. The inclusion of the policy-makers was very significant in this study, because they are charged with the policy formulations that are used to run these public sector organisations. Therefore, it was appropriate to solicit their views on the innovative activities of the PSOs, particularly regarding policy innovation and funding by the government. The inclusion of the policy-makers from the Ministry was to ensure that the data obtained were reflective of the innovation status of the PSOs. Again, PSOs operate under restrictive state policy, therefore it was important to gather from the policy-makers within the Ministries the information on public sector innovation policy. The Management of the PSOs rests with the Board of Management and chief executive (Managing Director) appointed by the Minister of Regional Development whose portfolio these PSOs fall under (MORDAs, 2008-2012). The Managing Director is in charge of the daily operation of the PSO assisted by a management team. Therefore the inclusion of the management was important since they were directly charged with the operations of these organisations and hence they possess a wealth of information, which was very significant for the present study. Management consists of first line managers to senior level managers who are heads of departments or sections.

The units of analysis consisted of individual, team and organisational levels. At the individual level of analysis, the study examined critical individual factors involved in enhancing and the implementation of innovation and creativity such as skills, knowledge and motivation. At the team level of analysis, the study explored critical factors such as team structure, team relationship between teams, and education background. At the organisational level of analysis, the key factors taken into account were; leadership, organisational climate for innovation, strategy, resources, prevailing culture, and environment. The employees were divided

into two categories as follow: non-supervisory and management. A self-administered questionnaire was given to both non-supervisory (general employees) and the management level employees. Focus group discussion was conducted specifically with the management (heads of departments) who are charged with policy formulation. This was significant in order to get in-depth information from them as key informants.

A question that faces most researchers is just how large their samples for the research should be (De Silva, 2011:96). Too large a sample might become unwieldy and too small a sample might be unrepresentative. It is critical to note, however, that there is no clear-cut answer for this question as it all depends on the purpose of the study and the nature of the population under scrutiny (Saunders *et al.*, 2013). The sample size needed to reflect the population value of a particular variable depends both on the size of the population and the amount of heterogeneity of the population (Modell, 2015:1143). Furthermore, sample size is also, to a certain extent, determined by the strategy of research adopted. For instance, a survey strategy usually requires a large sample, particularly if inferential statistics are to be used (Saunders *et al.*, 2013).

It should be noted that a sampling method also forms a fundamental foundation of any scientific research, therefore it is appropriate to have a sample size that will always stand the scientific test. The present study employs a Structural Equation Model (SEM) to test the Structural Model and hypotheses. Therefore, critical to this study is the sample size in order to meet the minimum statistical requirement that is associated with the application of the Structural Equation Model (SEM). Presently, there is no unanimous agreement among scholars (Hoe, 2008:77; Smith, 2004: 66) as to what constitutes a reasonable sample size. For instance, scholars (Haenlein & Kaplan, 2004:295; McQuitty, 2004:181; Tabachnick & Fidell, 1996) propose a minimum sample size of 100 to 200, when using a chi-square test as fit measure. McQuitty (2004) further argues that determination of minimum sample size is necessary in order to attain the desired level of statistical power before data collection. Other researchers (Garver & Mentzer, 1999; Marsh, Hau, Balla & Grayson, 1998; Nevitt & Hancock, 2001; Sivo, Fan, Witta & Willse, 2006; Suliyanto, 2011:33) advocate a minimum sample size of 200. Based on this, it is left to the researcher to decide which minimum sample size

will suit the need of the research in terms of representativeness, generalisability and statistically meeting the SEM requirement.

Structural Equation Model (SEM) places an enormous burden on the researcher in that it sets the minimum sample size that the researcher must set, before embarking on the data collection. Notwithstanding these conflicting discourses for the present study, the minimum sample size is taken to be 200. This is based on the recommendation that the minimum sample size suggested by the majority of scholars start from 100 to 200 (Haenlein & Kaplan, 2004:295; McQuitty, 2004:181; Tabachnick & Fidell, 1996). It should be noted that in a survey study, the return rate is always low; hence, the present study can only set minimum sample size that would actually be received after the distribution of the instruments. However, care should be taken due to the aforementioned problems of failure rate. The present study doubled the proposed sample size of 200 by administering self-administered questionnaires 400 randomly distributed to 537 employees, with the provision that at least the failure rate may be somewhere between 30% and 50%. Based on this simple assumption, the initial plan was to have 200 to 300 fully completed and returned questionnaires (Barrett, 2007: 820; Suliyanto, 2011:33). Therefore, a total of 230 questionnaires were collected from the participants, however useable data were from only 186. This sample was still considered reasonable and valid for this study.

4.2.4 Research philosophy

Philosophy is defined as, ‘the questioning of basic fundamental concepts and the need to embrace a meaningful understanding of a particular of field’ (Burke, 2007:476). Burke (2007:476) argues that, the discipline of philosophy can be used to allow research to be viewed in a certain way, by using particular acceptable approaches such as pragmatism, positivism, and interpretivism. The premise here is that, these acceptable approaches are useful to the innovation professional for three reasons. First, it communicates the stance of the researcher, secondly, it allows others to understand context and lastly, it provides a means of clearly articulating the results of the current research.

The present study utilised pragmatism as a philosophy to assess innovation in the public sector organisations. Innovation in the public sector is in fact ‘pragmatic’ since it deals with idea generation, risks taking and implementation of useful ideas in order to solve problems or improved services to the citizens. The philosophy of pragmatism encompasses many interesting ideas but perhaps what is most useful for elucidating the difference between pragmatism and other philosophies is its notion of truth (Baker & Schaltegger, 2015:265). Pragmatism as a philosophy is grounded on questioning the truth, which is the core of innovation in the public sector, since public sector deals with the provision of public value. Therefore, how the public sector provides innovative services to the general public in meeting their diverse expectations form the core of what is ‘true’ and ‘fair’ mitigating the problems affecting the society. Baker and Schaltegger (2015:265) opine that, pragmatism maintains challenging, albeit liberating truth when engaging with the world, which is referred to as ‘sensemaking’. The application of pragmatism philosophy in the present study is hoped, will have some benefits in terms of the ability to engage the organisational individuals being researched, and promote positive form of change that will contribute to the development of innovative public sector organisations.

Pragmatism stands as a large and well-developed philosophy that informs logic, metaphysics, philosophy of science, philosophy of the mind, ethics and aesthetics (Baker & Schaltegger, 2015:265). Originally pragmatism was developed based on the notion of anti-foundationalism, which is the belief that ideas do not exist as timeless and pre-existing perfect forms, but instead are formed contingently and experimentally in response to particular needs of the people live out their lives in a given place and time (Baker & Schaltegger, 2015:265; Barnes, 2008). These scholars go on to add, ideas are tools to accomplish particular tasks. Baker and Schaltegger (2015:265) posit that early pragmatists all share the epistemological position that meaning and truth is inferential rather than representational; that meaning comes from relationships with other expressions rather than a representational relationship with objects.

Death of John Dewey in 1952 marked the decline in interest in pragmatism as a philosophy and this corresponded to the rise of more analytic philosophy such as positivism (Baker & Schaltegger, 2015:266).

Logically, positivism was the opposite of pragmatism: it was foundational and believed in a single method for finding a single truth. However, scholars (Baker and Schaltegger, 2015:266) posit that, it was later revitalised by pragmatist Bernstein in 1965 and 1966 respectively. In fact pragmatisms could be seen as post-modern continental philosophy from America perspective, where Dewey could be seen as ‘Foucault with Hope’ (Marshall, 1995) in Baker and Schaltegger, (2015:266). While, Foucault’s post-modern conception of knowledge as power struggle leaves researchers as a “prisoner”, the pragmatic view see knowledge as a tentative hypothesis about what human actions should be (Baker & Schaltegger, 2015:266; Ruwhiu & Cone, 2010:112). Barnes (2008) states, Rorty’s larger aim was to redirect philosophy to the ‘problems of men’ the purpose of which was to move it away from narrow epistemological concerns such as defining the conditions for truth and towards larger social issues. While, Wolnicki (2012:500) states, pragmatists claim that truth is pre-eminently tested by the practical consequences of belief. Pragmatism theorises that the meaning of any conceptions may be sought in their practical bearings; that the function of thought is to guide actions; and the truth must be tested by practical consequences of belief (Richardson, 2010; Wolnicki, 2012:491). In addition to this, pragmatic approach involves, but is not limited to, the question of how knowledge claims are validated (Ruwhiu & Cone, 2010:122). It is argued that, pragmatism offers a more diverse and interpretive approach to the study of organisations, through opening up opportunities and countering the dominant epistemology of Western world. Pragmatism view sees all knowledge as best acquired through reason and the use of concepts and methods that are freed as much as possible from the fallibilities of our senses or the context of given situations (Cook & Brown, 1999; Ruwhiu & Cone, 2010:123).

In addition, scholars (Kemen & Rumens, 2012:11) state, pragmatists contend that, there are many ways of interpreting the world and some are better others. Pragmatist’s interest in what works and how and why it works (or does not) translates into notion of knowledge, which is ant foundational and directed towards problem solving using the data and the understandings available at the time. These scholars argue that, pragmatic researchers must show genuine interest in the future, but not the past, and therefore, should direct thinking toward future consequences rather than about evaluating the past (Kemen & Rumens, 2012:11).

Since, the present research focal is assessment of innovation in the public sector organisations, the study concerns itself with how organisations can leap into the future readily armed to tackle challenges using innovative approaches, hence the applicability of pragmatic philosophy to inform the methodological assumptions.

The present study, argues that to understand innovation as a discipline within business management, it is imperative that, study of innovation adopts both inductive and deductive paradigm philosophies. The theoretical underpinnings of the integration can help understand how various organisational actors translate organisational practices particularly through their embedded actions. The present study on the one hand is a survey approach which is a common strategy used in business and management research. This paradigm allows for the collection quantitative data that can be analysed quantitatively. On the other hand, the study also is a case study involving empirical investigation of a particular contemporary phenomenon ‘innovation’ within public sector organisations using multiple sources of data (Saunders *et al.*, 2013:138). The use of case study approach requires the integration of different data sources in order to understand phenomenon under investigation as with the case of innovation in the public sector.

The study of innovation has presented researchers with complex challenges such as integrating different stakeholders to be implemented. Innovation requires organisations to have the willingness and flexibility to accommodate unprecedented levels of change, but they (organisations) often find it difficult to sustain innovation (Mele, Courcio & Russo-Spena, 2014:613). Innovation involves dealing with different actors, with differing ideas, perception, and interaction in a system (social, cultural, economic, political, ecological). Organisations should allow innovation actors to access the knowledge, relationships and value throughout innovation ecosystem that shape organisation practices. There is unanimous agreement amongst innovation scholars, that innovation can emerge from anywhere struggles of all working activities of organisations and in relations with other actors (Adner, 2012; Mele, Courcio & Russo-Spena, 2014:632). These scholars point out that, finding and taking new opportunities for innovation and value creation requires managing knowledge

and networks of relationships (involving customers, employees, and a climate of innovation), as well as investment in the soft and social factors (culture trust, commitment).

In the present study, it is argued that, to gather data from these diverse stakeholders, there is need for diversity of approaches as presented by pragmatism philosophers to enable the research to yields valid results. For example, Johnston (2014:208) further adds that, there is no clear agreement as to what meant by research approaches, since the term maybe used to show how researcher undertakes the research activity, such as the methods the researcher intends to use. In addition, it maybe used to explain why they are undertaking research in a particular way. However, for the present study, research approaches is taken as the underpinning rationale for the way the research is undertaken. Fundamental to this study, is the understanding of the philosophical stance (position) taken and why such a stance is being advocated for herein. The present study, presents the research position of reality (ontology) and the appreciation of what it considers acceptable knowledge (epistemology) to identify the rationale approaches for the present study.

In the foregoing paragraph, a study of innovation requires methodology that can embrace the complexity, context and researcher persona, including individual and group research, procedures and roles. The present study suggests that, just by picking a few variables and test it with perceptual data using statistical techniques may only results in superficiality and emptiness. The study argues that, such research may only offer face validity and reliability, but not genuine validity and relevance (Gummesson, 2006:169). The current debate is based on what would be the most appropriate philosophical position (stance) from which research methods should be derived in studying innovation as the case with present study? To answer this question, the present study takes pragmatic philosophical stance. Pragmatic knowledge claims, collection of both quantitative and qualitative data concurrent triangulation strategies/approaches to better understand research problems (Cresswell, 2009:12). In the present case, data collection is gathered through a designed measurement instruments as well as text information (Focus Group Discussions) that gave ways to both quantitative and qualitative information. These types of data collection adopted herein is based on the assumption that, collecting diverse types of data best provides an understanding of research problems under investigation

(Kelemen & Rumens, 2012:7; Raich, Müller & Abfalter, 2014:751). Hence, the use of pragmatism philosophical assumptions in the present study, because, pragmatists believe that truth is what works at the time. Pragmatists believe in external world independent of the mind as well as that lodged in the mind.

4.2.5 Data collection

This section basically covers the use of questionnaires and Focus Group Discussion with informants, which were applicable to this study, besides them being the most common primary data collection techniques, used in contemporary management and business research to which this study lends itself. The present adopted concurrent approaches of data collection; that is the collection of both quantitative and qualitative data at the same time in the same visit to the field. From philosophical stance, the appropriateness of mixed methods of data collection is motivated by the fact that, it is mixed methods relate well with pragmatism philosophy as a procedure suitable for obtaining quality data. As postulated in Chapter 2, in the study theoretical perspectives (Framework), there has been an established relationship between the use of mixed methods and theory development (Loo & Lowe, 2011:24).

4.2.6 Quantitative data collection

Quantitative data was purely collected through structured questionnaires, while qualitative data was collected through focus group discussions (FGD) with middle managers. These two methods of data collection are known to complement each other (Modell, 2015:1143). First, permission was obtained from the participating organisations (Ministry of Regional Authorities, Lake Basin Development Authority and Kerio Valley Development Authority), through a signed letter that was sent to them. The letter was written on a University letterhead and sent to them through the post. After obtaining the go-ahead with the research, a covering letter shown in Appendix 1 was attached to the study instrument and sent to each employee of the participating organisations requesting them to participate in the present survey. This was done to obtain their free consent without coercing them. The letter sent to employees was carefully worded to avoid any ambiguity as to the

intention of the survey. The contents of the letter covered issues such as privacy, withdrawal at will and a non-disclosure to the third party without the participants' express written permission. The participants were supposed to sign the consent form, indicating their agreement to participate in the present study.

The administration of the questionnaire to the participants took place from June to July 2012. The participants were given questionnaires through a point person (work mate) from the human resource department of each participating organisation. Each employee was asked to drop each completed questionnaire at their respective human resource departments to be collected later, and then finally handed over to the researcher by the point person at an agreed date. This approach was good since the respondents were dealing with someone whom they know well as opposed to a stranger. In addition, this approach gave the participants the opportunity to fill in the questionnaires at their own pace without interfering with their work activities. In addition the present study was conducted at the time when the organisation was undergoing an annual ISO 9000 audit, hence most of the employees, specifically senior management, were busy with the preparation for the audit exercise.

4.2.7 Qualitative data collection

Focus group discussions: Given the time and resource constraints, the researcher only managed to organise two FGD sessions with middle management to collect qualitative data for the present study. At first the middle managers of the various departments were approached through a point person who briefed them on the intention to invite them to participate in the focus group discussions. The purpose of the FGD was explained and after obtaining their consent, an appointment was made, the date, time and venue of the meeting agreed on in advance. The departments concerned were human resources, planning, research and development and investment promotion, technical services, agriculture and fisheries, finance, planning, administration, corporate affairs, procurement, and audit. The sampled departments represented the surveyed organisations and were considered to be representative of the study population in terms of unit of analysis, gender, occupation, and geographical distribution. The study adopted a convenience-sampling procedure

when choosing management to participate in the FGD. The reason for this choice was mostly guided by the cost, time and effort.

A sound recorder was used to capture the focus-group discussions (FGD). The discussions were later transcribed, categorised, and analysed using thematic (content) analysis (Saunders *et al.*, 213:138). The FGD was held in the Lake Basin Development Authority (LBDA) boardroom. The place was ideal for such FGD session since it offers an attractive ambience for the participants. The FGD was organised through the assistance of the organisation management, which agreed that there were no problems in conducting focus group discussions on the premises.

The participants consisted of two groups of participants, sixteen in all, six women and ten men, purposively drawn from among the middle managers. The purpose of the FGD was made clear to the participants and they were assured of the confidentiality of the outcome of the interviews. The participants were mainly middle managers, heading different sections / units of the organisation. The selection of these managers was informed by the study topic. Innovation is still a term not well understandable particularly within the public sector, hence to get depth information with subject and how it is understood within the organisations it was prudent to limit the FGD to managers.

The participants were presented with seven pre-determined questions during the Focus Group Discussion (Appendix 2). The focus group discussion comprised two groups consisting of eight members each. The participants were drawn from middle managers that were heading different sections or units within the organisation.

The FGD was conducted at the Lake Basin Development Authority (LBDA) boardroom during working hours. This was organised by the manager who was authorised by the Executive management to assist the researcher with data collection. The boardroom provided a favourable environment suitable for this type of interview as the chairs were arranged in a circle. The researcher started the FGD interview with the first group from 11.15 am to 12.45 pm. This was within the duration of interviews that recommend a minimum

period of 45 minutes to 90 minutes maximum (Kelly, 2012:300). Organisational representatives that were tasked to assist with the whole process introduced the researcher to the members of the organisation and thereafter the researcher introduced the topic of the study, that is, 'innovation,' to the FGD members. The second group of FGD with 8 members was conducted on the second day from 11 am - 12.30 pm.

Focus group discussions (FGD) were based on the seven major themes of the research. The interview questions were pre-determined to ensure consistency and flow that allows the participants to air their views systematically and for easy recording. The FGD schedule is given in Chapter 5. The researcher adopted repetition techniques as a way of identifying themes and sub-themes in collecting qualitative data. Christopher (2014:53) states that themes can be identified through the topics that 'occur' and 're-occur'. It is argued that the more the same concept occurs in a text, the more likely it is a theme (Smith & McElwee, 2015:376). The participants were probed to clear up any doubts on the responses that they gave during the interviews to make sure that there was clear understanding of the concepts and to gain a consensus among the participants on the topic under study. The results of the analysis of the qualitative data are presented in the results section in Chapter 5.

4.2.8 Triangulation

The present study applied two methods of data collection sources to study the assessment of innovation in the Kenya's public sector organisations. The first phase of the study utilised questionnaires to collect quantitative data to study innovation in the Kenyan public sector organisations. In the second phase the present study relied on the theories, concepts and focus group discussions (FGD) to mine qualitative data. When the two methods are used in a single study as in the present study, it is referred to as mixed methods (Migiro & Magangi, 2011:3757). The data obtained using two methods and the different results from the two analyses complement each other. The results from one method are used to support or refute the other method. The rationale of triangulating the present study was informed by the desire to ensure that data collected are presenting what the study sought to have achieved based on the research purpose, secondly, to get in-depth

information from the participants for the present study, and to facilitate comparison of qualitative and quantitative data sets to produce well-validated conclusions (Loo & Lowe, 2011:27; Migiro & Maganga, 2011). The present study adopted the triangulation approaches to collect data, analyse and interpret the results. Thereafter, results obtained from different methods employed in the present study were integrated under discussion headings. These results helped not only in developing of a study model as presented in the results section in Chapters 5, and 6, but also supported data from each method, either quantitatively or qualitatively.

4.2.9 Instrument development and measurement scale

The present study proposed a theoretical model that was tested empirically in order to determine the structural relationship between the predictors and outcomes variables. The measurement instrument was developed based on the review of the previous works of scholars (Amabile *et al.*, 1996:1159; Andriopoulos, 2001:835; Bandura, 1977; Nyström, 1990:145) and the literature on creativity and innovation. On one hand, scholars Amabile *et al.*'s (1996) study on assessing the work environment for creativity identifies factors responsible for organisational innovation as organisational resources, pressures, autonomy / freedom, encouragement of creativity, and supervisory management. Bandura's (1977) social learning theory suggested that interactions between a person, situation and behaviour create an enabling environment for learning to take place in the organisation. Nyström (1990:145) identified innovation as strategic leadership, organisational culture and climate. Similarly, Andriopoulos (2001:835) identified innovation determinants as structure and system, resources and skills, organisational culture, and organisational climate. All these theories have been discussed in Chapter 2 of the present study. In addition to the aforementioned theory, to develop a measurement instrument for the present study, a review of extensive relevant literature on innovation was done in Chapter 3, and expert inputs were incorporated to make the final instrument as shown in the pilot test below. The instrument for the study was a structured questionnaire based on a 5-point Likert type scale as shown in Appendix 2. The present study applied a measurement instrument divided into five sections as follow: Section 1: drivers of innovation 1-65 items, rated 1- *strongly disagree* to 5- *strongly*

agree; Section 2: barriers to innovation 66-89 items rated 1-*definitely not a barrier* to 5- *definitely a barrier*; Section 3: overcoming barriers strategies rated as 1-*not important* to 5 *extremely important*; Section 4: indicators of innovation 111-115 items rated as 1- *not important* to 5-*extremely important*. The last Section, 5 measured the demography of the participants.

4.3 PILOT STUDY AND THE REFINEMENT OF THE ITEM POOL

The present study instrument was first piloted on 53 respondents who were mostly industry experts and professionals. The data obtained from the pilot study with the 53 respondents were analysed using SPSS version 20. The results of the pre-test revealed some flaws in the instrument items, some of which had to be either dropped or rephrased. This helped in detecting possible flaws in the measurement procedures (Sharifirad & Ataei, 2012:503) and to identify unclear or ambiguously formulated items. The variables are: innovation outcomes (outcome variable) and predictor variables (Internal, Environment, Barriers, and Overcoming Barriers). Weaker items, specifically those found ambiguous and confusing were removed or rephrased, while those items that were loaded highly on the constructs were identified. Scale items were examined on the basis of item differentiation and measurement width within scales by analysing inter-item correlations and semantic context. A total of 103 items were retained after all the processes were completed and an additional 12 items were added as a result of the expert advice to form the final measurement instrument. The questionnaire meant for use by all employees contained only straightforward statements. The first page contained a brief biography of the researcher, and instructions explaining the purpose and the format of the questionnaire. They were requested to complete all the questions as far as possible.

4.4. DATA ANALYSIS AND RESULTS OF THE PILOT STUDY

In constructing measurement instrument, there are four factors that a researcher must take into account. For example, Huysamen (2006:36) states that any test blueprint should describe in detail the purpose of the test first in terms of which attribute is to be measured; secondly, to what extent the speed versus power of performance will be relevant; thirdly, for which population the test is intended; and, lastly for what purpose

the results of the tests are going to be used. Since the present study was based on assessment of innovation drivers in the PSOs, the study adopted a logical keying approach to construct the measurement instrument. In the logical keying approach, item construction was based on the factors perceived to be the main drivers, barriers, strategies to overcome barriers and innovation outcomes. To successfully accomplish the items construction using the logical keying approach, the researcher relied on both intuitive-rational and theoretical approaches. In the first place, in the intuitive-rational approach, the researcher relied on understanding of the content validation of the relevant literature on public sector innovation in order to isolate items to be included in the measuring instrument. Secondly, other items to be included in the test instrument were based on theories of innovation (see Chapter 2).

The pilot instrument item questions were constructed on rating scale as follows: (1) *No extent at all*; (2) *Small extent*; (3) *Not sure*, (4) *A great extent*, (5) *A very great extent*. The first reliability of the instrument was tested using Cronbach's alpha. The results of reliability tests are shown in Table 4.6. It can be seen from Table 4. 6 that the results of the Cronbach's alpha reliability test are based on standardised items ranging from 0.799 to 0.947, indicating that the piloted instrument has an acceptable reliability level. Thereafter, descriptive statistics were employed, namely, mean (*M*), standard deviation (*S.D*), and frequencies (*f*) to determine how the participants responded to the item questions. It helped to find out which factors were true measures of the various variables of the present study.

Table 4.3: Model Fit Indices (Hu & Bentler, 1998:444)

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	No of Items
0.799	0.947	103

Standard deviation (*S.D.*) and mean (*M*) scores for the total 103 items are presented in Table 4.4. The results of the descriptive analysis indicate that mean score ranges from 2.61 to 5.30; while standard deviation (*S.D*) ranges from 0.66 to 9.99. It was discovered that some items (predictor variables) had a low mean with the

outcome variables, while others had a high standard deviation and had to be either dropped or rephrased. All the calculations are summarised as shown in descriptive statistics in the Appendix 2.

The sub-sequent section deals with the empirical data analysis using structural equation modelling (SEM) of the present study.

4.5 SEM PROCEDURE

The present research employed standard SEM analysis steps that are discussed briefly in the subsequent paragraphs.

4.5.1 Model specification

The model developed in the present study was theory and concepts-based. Therefore, model specification for the present research was done taking into account theoretical and conceptual relationships among variables.

4.5.2 Model identification

The present study model was first identified before estimation. The purpose was to find out whether there was sufficient information, such as adequate number of observed variances and covariances. The model identification was performed to allow estimation of all the model parameters.

4.5.3 Confirmatory factor analysis (CFA)

Confirmatory factor analysis was performed on all variables with multiple indicators. After performing CFA on the data it became clear that the model was not acceptable. Hence, it was decided to carry out model revisions guided by the theory underpinning the present study. Finally, the responses from focus group discussions (FGD) were coded, analysed and interpreted to support the quantitative data analysis findings. However, to assess the adequacy of the refined subscales and structure, a confirmatory factor analysis (CFA) of the proposed model was performed on the remaining data.

4.5.4 Global model fit indices

The study was performed according to Structural Equation Modelling (SEM) to evaluate and test how well the proposed structural model that contained observable variables (indicators) and hypothetical constructs explains or fits the data collected. The results of the application of SEM to the data revealed the model fit as adequate, but not a good fit. This resulted in a model identification problem. The results of this could be attributed to at least two things, one being either poor measurement or structural deficiencies. To compensate for this problem encountered, the criteria for guidelines for fit are set out in Table 4.8. However, statisticians are not unanimous on what constitutes a good fit. In fact Weston and Gore (2006:742) point out that finding an exact fit is rare and a real problem in itself. In addition to this, Hox and Berger (1998) opine that asking for a perfect fit from a researcher conducting SEM analysis would be asking too much. Given these controversies, it was necessary to search for literature on cut-off values as summarised in Table 5.7 that is considered as a good fit and what may be regarded as an adequate fit. The present study used the guidelines shown on the Table 4.8 below to assess and evaluate the fit model (Weston & Gore Jr., 2006:745; Schreiber *et al.*, 2006; Hooper *et al.*, 2008).

There are several fit indices meant to measure goodness-of-fit and scholars (Bentler & Wu, 2002; Smith & Langfield-Smith, 2004; Schreiber *et al.*, 2006) recommend that, before adopting one fit over the other, researchers should evaluate the models by observing more than one of these indicators. SEM software packages provide a range of estimation techniques some of which can be applied to different situations and which demonstrate that results can vary greatly depending on the estimation technique used. Smith and Langfield-Smith (2004) are of the opinion that it is important to report the choice of estimation technique, along with the reasons for that choice. The current study adopted the fit measure indices displayed in Table 4.7 below. An attempt has been made to justify the choice of the fit measure indices over other fit indices as demonstrated in the following paragraphs.

Maximum likelihood estimation (MLE) – This is the default estimation in most structural equation modelling (SEM). It is said that MLE is a full information estimation technique that provides efficient

estimates of coefficients of multivariate normal data (Smith & Langfield-Smith, 2004). MLE also has been found to give suitable estimates for estimation where observations are small, for example, sample size less than 200 as in the present case (Hox & Bechger, 1998:9). These scholars, Hox & Bechger (1998:9) state that MLE methods are appropriate for non-normally distributed data and small sample size. Therefore, the present study used MLE due to its appropriateness to small sample size as in the computation of fit measures. However, it should be noted that a common problem associated with data collected from a lengthy questionnaire is missing data, as was the case with the present study (Patterson, West, Shackleton, Dawson, Lawthom, Maitlis, Robinson & Wallace, 2005:388). Therefore, MLE has been recommended as the best method that uses all available data to produce estimates (Patterson *et al.*, 2005:388). To overcome the problem of not getting fit indices, MLE was used to assess the goodness-of-fit in missing data situation. The first step was to assess the overall goodness-of-fit of the specified model that required estimation of parameters. The second step involved obtaining accurate standard errors for more critical ratio tests.

Chi-square (χ^2) – This is the most commonly used method of evaluating goodness-of-fit. It is said that a low χ^2 value, indicating non-significance, would point to a good fit (Hoe, 2008:78). In this regard, chi-square test is used to assess the difference between actual and predicted matrices. Thus, if the χ^2 test statistic is not statistically significant it means that the actual (based on observation) and predicted (based on theory), matrices do not differ significantly. Therefore, Hoe (2008:76) is of the opinion that low χ^2 values, which result in significance levels greater than 0.05 to 0.01 indicate that actual and predicted inputs are not statistically different. On the other hand, Fornell (1983:445) is of the opinion that the significance levels of 10% or 20% should be exceeded before non-significance is confirmed.

To apply Chi-square (χ^2) as a model's goodness-of-fit, p-values indicate whether the model is significantly different than the null model. The null hypothesis is the hypothesised model in which the parameters were set up for the hypothesised model, indicating whether a path should exist or not between the variables (Hoe, 2008). In the present study due to the sensitive nature of Chi-square to sample size, for example, larger samples of more than 200, the application of Chi-square is more appropriate using SEM (Smith & Langfield-Smith, 2004).

Therefore, based on the Table 4.8, the cut-off goodness-of-fit for $\text{Chi-square}/df < 2$ and $df = < 3$. Chi-square is one of the indices this study employed to test the goodness-of-fit of the model.

Table 4.4: Cut off goodness fit for the model

Fit Indices	Good fit	Adequate fit
Chi-square value	Non-significant	Non-significant
Chi-square/df	<2	<3
Comparative fit index (CFI)	>0.95	>0.9
Root mean square error of approximation (RMSEA)	<0.06	<0.08

Comparative Fit Index (CFI) – This is one of the most commonly used fit indices in SEM analysis. This is equal to the discrepancy function adjusted for sample size. CFI ranges from 0 to 1 with a larger value indicating better model fit and the acceptable model fit is indicated by a CFI value of 0.9 or greater (Hu & Bentler, 1999:444). This is a revised form of the Normed Fit Index (NFI), which takes into account sample size (Bryne, 1998) that performs well even when sample size is small (Tabachnick & Fidell, 2007). This statistic assumes that all latent variables are uncorrelated (null model) and compares the sample covariance matrix with the null model (Hooper, Coughlan & Mullen, 2008:54). It should be noted that this is one of the measures of fit least affected by sample size (Diamantopoulos, Riefler & Roth, 2008; Hoe, 2008:79). The agreed cut-off of 0.9 is needed in order to ensure that misspecified models are not accepted (Hooper, Coughlan & Mullen, 2008:55), whereas the value of $CFI \geq 0.95$ is indicative of a good fit. The present study employed CFI as shown in the next computation of model fit.

Root mean square error of approximation (RMSEA). The RMSEA index was developed by Steiger and Lind (1980). It tells how good a model is, and is found to work well with parsimony because it chooses the model with fewer parameters. One of the greatest advantages of RMSEA is that it provides for a confidence interval to be calculated around its value. It generally allows for the null hypothesis (poor fit) to be tested more precisely (McQuitty, 2004:178). As indicated in Table 4.8 above, RMSEA is considered as a good fit

when the lower limit is close to 0, while the upper limit is less than or equal to 0.08 (Hooper, Coughlan & Mullen, 2008:54). The present study employed RMSEA as demonstrated in the computation of the overall fit indices in subsequent sections.

Confirmatory factor analysis (CFA) - CFA is a technique which is theory driven (Schreiber et al., 2006). This is because the analysis involving the application of CFA is driven by theoretical relationships among the observed and unobserved variables (Schreiber *et al.*, 2006). The procedure involved in conducting CFA requires one to use the hypothesised model to estimate a population covariance matrix that is compared with the observed covariance matrix. To perform CFA, regression coefficient is fixed at 1. Coefficients are fixed to a number to minimise the number of parameters estimated in the model. CFA is also used to test the reliability of the observed variables, and to examine the extent of interrelationships and covariation among the latent constructs (Schreiber *et al.*, 2006). Schreiber *et al.* (2006) further add that as part of the process of CFA, factor loadings, unique variances, and modification indexes, (in a case where a variable is dropped or a path added) are estimated for one to derive the best indicators of latent variables prior to testing a structural model. CFA was used to test the measurement model i.e. to see whether the observed variables questions are reliable measures for the constructs, taking the entire model together. Once satisfied that the measurements are okay, the paths are put in linking constructs and the structure is tested with SEM.

Fit assessment

An in-depth assessment of the fit of the model can help a researcher to identify the possible location of any model fit problems and pinpoint any possible model revisions. Scholars like Tate (1998) have laid down two types of SEM results useful to this problem; First the differences between observed values and reproduced values for specific variances and covariances (covariance residuals), and indices indicating the degree of overall model fit improvement (expressed as degree of Chi-square statistic) larger than 2.0 to 2.5 point to a misfit that most likely did not occur by chance only. The result of this is the need to identify paths to be added or combined to a model with poor fit. This is the modification index for each missing path or deleted paths or possible model parameters. Therefore, the absence of any major modification indices would be seen

to be consistent with good model fit. Alternatively, any major modification indices would suggest that the model could be improved through revisions.

4.5.5 Criteria for model revisions

In order to perform SEM analysis, a criterion was set out. The study model in the present study is confirmatory in nature. Therefore, the hypothesised model has been tested with data. In this case the study will remain purely confirmatory, if the initial hypothesised model is evaluated and found to be acceptable and consequently no further call for any revisions would be required. However, if the hypothesised model is found to be unacceptable, then it is common practice to revise the model in order to achieve an adequate fit. The revision of the model was performed by introducing an exploratory element into the study, and taking into account the possible model revisions on the study data. This resulted in addition of one path, and the combination of two paths to the initial hypothesised model.

The possible paths to be added or deleted are indicated by the modification index. This index consists of recommended changes (which could be expressed as a decrease in the Chi-square statistic), should a path be added to the model. Any absence of large modification would signal that a good model fit has been achieved. In the present study, there were strong correlations between latent variables labelled as internal and external drivers, consequently it was desirable to combine internal and external factors into a single factor labelled 'Innovation Drivers' (c.f. Patterson *et al.*, 2005:389). This resulted in a model modification through the deletion of a path on the study structural model.

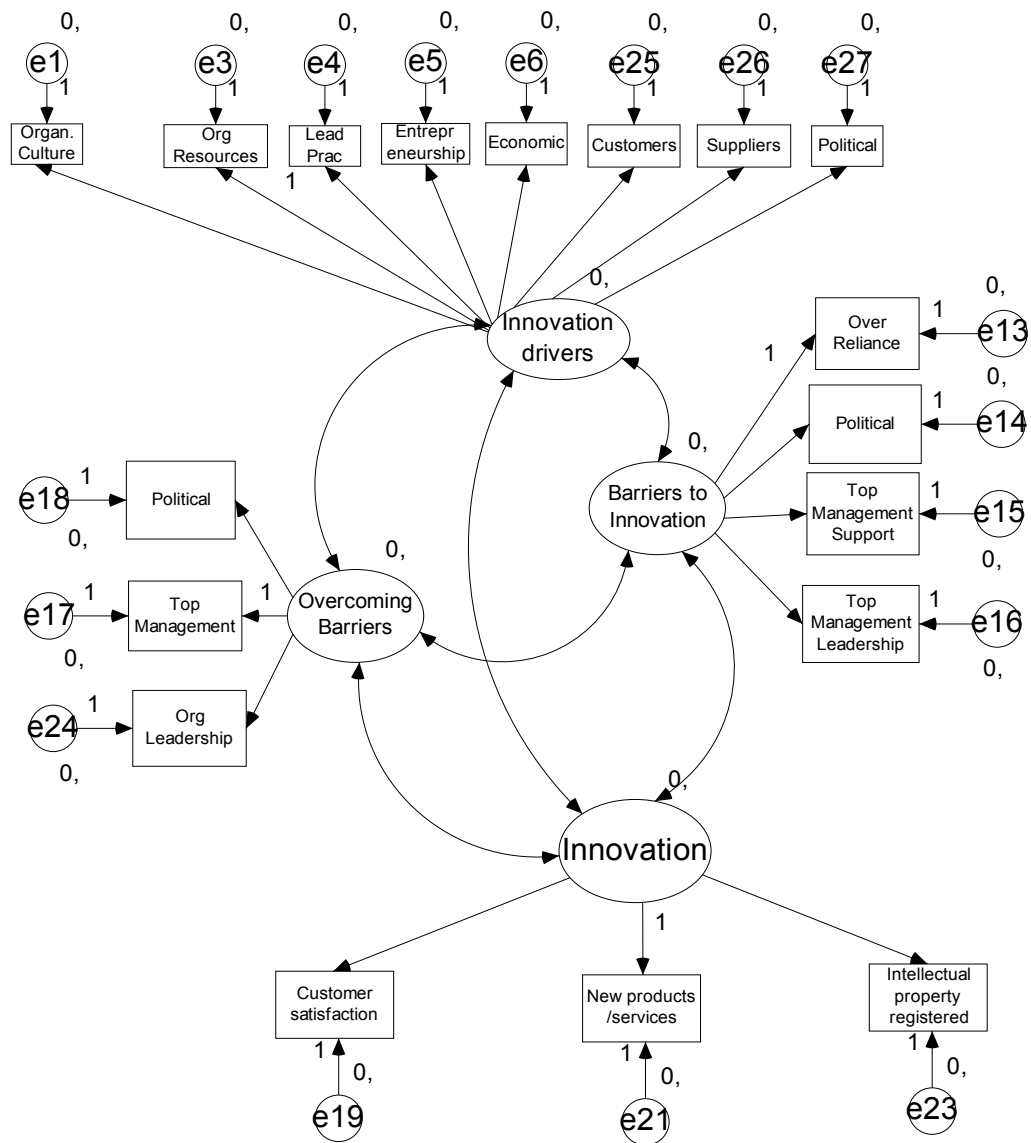
It is common practice that the hypothesised relationships among the latent variables having multiple observed indicators consist of two separate steps (Tate, 1998). First, confirmatory factor analysis (CFA) was performed to describe how well the observed indicators served as a measurement achieved based on the criteria above. Then a hypothesised full structural model with latent variables was subjected to test to assess the hypothesised interrelationships among the latent variables in the present study.

4.6 SEM ANALYSIS

The hypothesised empirical structural model in Chapter 2 was tested using AMOS 17 software. In order to test the hypothesised structural model, first Confirmatory Factor Analysis (CFA) was performed using AMOS 16 integrated with SPSS V 17 to estimate and test the measurement model taking into account all the latent constructs. In this stage, the strength of the paths between the factors and their observed variables are important. The proportion of variance accounted for by all the latent variables measures the reliability, and construct validity can be assessed by the size of the factor loadings. In this model, common fit model measures were applied to evaluate and test the model. The ratio χ^2 to the degrees of freedom (df) (χ^2/df); Comparative Fit Index (CFI) and Root Mean Square Error of Approximation (RMSEA).

The Figure 4.9 is a graphic representation of the hypothesized structural model in chapter 2 of the thesis that was tested to see how well it fits the data. First, regression coefficients are fixed to 1 and 0 respectively. Coefficients are fixed to a number to minimise the number of parameters estimated in the model.

Figure 4.9 Structural model with standardised estimates



4.6.1 Study model measurement specification

The current study hypothesised measurement model in Chapter 2 of this thesis requires that each latent variable consist of three (3) or more indicators (questionnaire items). In this study, there were 4 latent variables as follows; innovation drivers (latent variable) consisting of 55 questions grouped into 8 indicators/observable indicators (organisation culture, organisation resources, leadership practices, entrepreneurship of the top management, economic, customers, suppliers, political support). Barriers to innovation (latent variable) consisting of 22 questions grouped into 4 indicators (over-reliance on natural resources, political interference, lack of top management support, lack of support from top leadership). Overcoming barriers had 19 question items grouped into 3 indicators (political support, top management support, leadership support) and finally, innovation indicators / outcomes measured by 3 indicators (customer satisfaction, new products/services and intellectual property rights) only. The scale of each latent variable was fixed by assuming that the variance of each latent was equal to one and error was equal to zero.

4.6.2 Study model measurement identification

The result of the measurement model in Chapter 2, as shown in Figure 5.1 has implications for model identification, which concerns the determination of whether model estimates are unique (Chin, Peterson & Brown, 2008: 289). It is recommended that a model be identified prior to estimation. At this stage, it is advocated that three measurement items per construct would be enough for identification if each item is connected only to its respective construct and error items are not correlated (Chin, Peterson & Brown, 2008:289). Chin, Peterson and Brown (2008:289) further point out, that even when there are only two items per construct, and error items are not correlated, identification can still be achieved, if there are structural connections among all the constructs.

For this measurement model, there were 18 observed variables and 171 variances, and 63 parameters to be estimated. This resulted in the model being over-identified, hence making it possible to test the model.

4.7 RESEARCH ETHICS

In order to carry out this study in these organisations, first and foremost permission was obtained to allow access to the facilities and to gain access to the population of the study. Contact was established with the concerned organisations through a carefully and politely worded letter requesting permission to carry out the study. The topic and purpose of the research were given and the letter printed on University letterhead. The letter also highlighted the time and resources required from the individual organisations during the survey. The copy of the letter is shown in Appendix 4. In addition, great care was exercised to ensure that the organisations were not stretched in terms of time and resources. This was followed by a visit to these organisations in person to discuss with them the value and the importance of this study both for academic purposes as well as for the concerned organisations. Another important issue that was addressed was the confidentiality and anonymity of the organisations and individuals participating in this study. In order to treat these findings with utmost confidentiality, no source, individual or organisation was identified or comment attributed without written permission of the originator (Saunders *et al.*, 2013).

The study also addressed the issue of data management by adhering to the best code of ethics to ensure that data obtained were the only ones used in the analyses and there was no manipulation of such data for the benefit of the researcher or the participating organisations.

4.8 SUMMARY

In Chapter 4 the study discussed the research methods, design, analyses, scope of the present study and participants demographics. The methods were based on the study objectives, research questions and hypotheses and on the theoretical framework shown in Figure 2.5 in Chapter 2, and the literature review in Chapter 3. The chapter detailed the methods used in the present study in the context of the public sector organisations in Kenya. The data collected for the present study were all based on the sample taken from Kenya's public sector organisations. A sample of 186 employees participated in the survey. Both quantitative and qualitative data were collected using the designed instrument, which were later analysed. The instrument

was first pre-tested with selected public sector experts to get their views on which important variables would form part of the study instrument. Their views were incorporated in the final measuring instrument.

To collect the data for the present study, permission was obtained for the purpose from the surveyed public sector organisations. The quantitative data were analysed using SEM supported by regressions analyses, while thematic analyses was applied to the qualitative data obtained through FGD with selected managers of the Kenyan PSOs. These analyses and results are detailed and presented in the following Chapter 5.

CHAPTER 5 RESULTS

5.1 INTRODUCTION

The previous Chapter focused on methods that were used to collect the data from the participants of the present study. This section highlights results for both quantitative and qualitative methods based on the data that were collected in Chapter 4. First this section presents the results of descriptive statistics, factor analysis, structural equation model, and multiple regression analyses. Secondly, Qualitative data was analysed thematically. After the completion of the analysis using multiple regression analyses, the present study applied Structural Equation Modelling (SEM) using Analysis of Moments Structures (AMOS) Version 16 integrated with SPSS Version 17 in order to obtain hypothesised relationships in the structural model. The analysis of quantitative data was further followed and supported by the qualitative data analysis.

5.1.1 Reliability and validity analyses

The criteria for deciding which forms of data analysis to undertake are governed both by fitness for purpose and legitimacy – the form of data analysis chosen must be appropriate for the kinds of data gathered. Saunders *et al.* (2013) reinforce that it would be inappropriate to use certain statistics with certain kinds of numerical data; for instance using means on ordinal data.

5.1.2 Descriptive statistics

The present study utilises the data collected in Chapter 4 to determine how well the mean and standard deviation represent the data on samples of 186. The results indicate that mean and standard deviation are measures of how fairly the data is represented. Table 5.1 presents a summary of the means (*M*) and standard deviations (*SD*) of all items. The analysis indicates that all the variables had mean (*M*) and standard deviations (*S.D*) of all items ranging from 3.35 to 4.17 and 0.71 to 1.01 respectively. This implied data were fairly distributed and fairly representative of the participants' views.

Table 5.1 Mean and standard deviation

	Mean	Std. Deviation
Org_Strat	3.5673	.97349
Org_Cult	3.3549	1.07387
Org_Resources	3.7066	.83574
Customers	3.5918	.84192
Suppliers	3.7948	.76004
Lead_Prac	3.4427	.82201
Entrepreneurship	3.7745	.80957
Gov_pol_EXT	3.7363	.88404
Economic	3.7653	.71612
Social	3.9561	.78273
Collaboration	3.8434	.75072
Over_Reliance	3.6547	.99036
Gov_failure	3.8278	.92014
Weak_Linkages	3.5723	1.01195
Top_Manag_Support	3.8024	.85081
Gov_Pol_Over_Barr	4.1725	.78789
Manag_Comm	3.9773	.77380
Innovation	4.0669	.75307
Technology	3.9872	.76526
Org_Rest	3.7080	.83643
Organ_St_Cul	3.4488	.98588
Innov1	4.1493	.81734
Innov2	3.9368	.92247

To determine the strength of the relationship between the two variables, a correlation was performed on the data. On one hand, it is advocated that the correlation value (r) should range from 0 (no relationship) to 1 (perfect relationship) (Koe, 2013:33). On the other hand, a study by Elifson, Runyon and Haber (1998) states that a r -value that ranges between 0.01 and 0.30 should be considered as weak, while a r -value that ranges from 0.31 to 0.70 should be considered as moderate, and a r -value of 0.71 to 0.99 should be interpreted as

showing a strong relationship. However, in the present study r-values obtained were above 0.31 except for the variables social, collaboration and technology (0.18, 0.22 and 0.24 respectively), which had a weak relationship. Despite the slight weak relationship established in these variables and possible problems with multi-collinearity, still the all variables were retained (Pallant, 2011).

After the calculation of mean and standard deviation, Cronbach's alpha was performed on the data shown in the previous Chapter 4 to determine the reliability of the data. The stability or consistency with which the items in a measurement scale measure can be referred to as reliability that can be determined through internal consistency (Goswami & Haider, 2014). In determining stability or consistency of the items, usually Cronbach's alpha (α) is considered as the appropriate indicator of internal consistency. The present study items' reliability or consistency is shown by Cronbach's alpha in Table 5.2. Confirmatory factor analysis was performed to extract the factors to confirm the validity and reliability of the sub-constructs as part of the main variables (dependent and independent). This was done to gauge if the measuring instrument measures what it was designed to measure. The results show all the constructs have Cronbach's alpha values above 0.7 which is considered good, therefore it can be concluded that the data have acceptable degrees of reliability and validity in this case (Alban-Metcalf & Alimo-Metcalf, 2013:61; Chiu & Hofer, 2015:524; Chon & Zin, 2012:436; Cronbach, 1951).

Table 5.2 Cronbach's alpha reliability of the groups items

Latent Construct	Observable Variables	Indicators (questions from questionnaire)	Cronbach's α coefficient
Internal factors	Organisation Strategy	q1 – 14	0.865
	Organisational Culture	q5 - q9	0.901
	Organisational Resources	q20 - q24	0.813
	Leadership practices	q25 - q34	0.927
	Entrepreneurship	q35 - q39	0.864
	Economic	q47 - q51	0.757
	Collaboration	q61 - q65	0.825
External factors	Government / Political	q40 - q46	0.916
	Social	q52 - q56	0.831
	Technology	q57 - q60	0.859
	Customers	q10 - q14	0.808
	Suppliers	q15 - q19	0.814
Barriers to Innovation	Over-reliance	q66 - q70	0.884
	Government failure	q73 - q74	0.75
	Top management support	q78 - q81	0.887
	Top management leadership	q84 - q86	0.819
Overcoming Barriers	Government / Political	q90 - q95	0.885
	Top management	q96 - q101	0.896
	Organisational leadership	q102 – q110	0.904
Innovation		q111 - q115	0.769

Factor analysis is a statistical procedure used to uncover relationships among many variables. This allows numerous inter-correlated variables to be condensed into fewer dimensions, called “factors” (Goswami & Haider, 2014:245). This was performed to examine the pattern of correlations (co-variances) between the observed measures (Myung, 2003). It measures the variables that are highly correlated either positively or

negatively and how they are likely to be influenced by the same factors, while those that are relatively uncorrelated are likely to be influenced by different factors (Myung, 2003).

5.3 Sample adequacy

In the previous paragraph, validity was determined utilising factor analysis. The KMO measure of adequacy was performed to determine the sample adequacy and the measure obtained was 0.685, which has passed the lowest base of 0.6 (Goswami & Haider, 2014:245; Pallan, 2011). Bartlett's Test of Sphericity was significant at p -value = 0.000, approximately $\chi^2 = 6119.680$ and $df = 253$. This indicates the dataset suitability for conducting factor analysis for the variables being investigated.

Table 5.3 KMO and Bartlett's test of sampling adequacy

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.685
Bartlett's Test of Sphericity	Approx. Chi-Square	6119.680
	Df	253
	Sig.	.000

Principal component analysis was performed to extract the factors and varimax rotation was utilised to maximise the dispersion of loadings among the factors. There were initially 23 factors / components which were extracted that met the criterion of eigenvalue ≥ 1 . Both KMO and Bartlett's statistics indicated that factor analysis was appropriate to be conducted.

Table 5.4 Total variances explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	6.723	29.233	29.233	6.723	29.233	29.233	3.846	16.723	16.723
2	3.184	13.845	43.078	3.184	13.845	43.078	3.284	14.277	31.000
3	2.739	11.910	54.988	2.739	11.910	54.988	3.037	13.204	44.204
4	2.297	9.989	64.977	2.297	9.989	64.977	2.876	12.503	56.707
5	1.652	7.183	72.160	1.652	7.183	72.160	2.489	10.822	67.529
6	1.241	5.394	77.554	1.241	5.394	77.554	2.306	10.025	77.554
7	.743	3.229	80.783						
8	.677	2.944	83.727						
9	.599	2.605	86.332						
10	.496	2.156	88.488						
11	.441	1.918	90.406						
12	.377	1.638	92.044						
13	.347	1.508	93.551						
14	.341	1.483	95.034						
15	.299	1.299	96.333						
16	.212	.922	97.254						
17	.203	.884	98.138						
18	.168	.731	98.869						
19	.155	.675	99.544						
20	.104	.452	99.996						
21	.001	.002	99.999						
22	.000	.001	99.999						
23	.000	.001	100.000						

Extraction Method: Principal Component Analysis.

All the observed communalities were greater than the recommended threshold of 0.3, lying between the minimum of 0.541 and the maximum of 0.979 (Bücker & Hoops, 2013:89; Chon & Zin, 2012:436). Principal Component Analysis (PCA) was performed to examine the interrelations among set variables in order to identify the underlying structure of those variables. The results of the PCA confirmed that a number of items shared some common variance with other items.

From Table 5.4, the eigenvalue criterion recommends picking factors with an eigenvalue greater than 1. In this study as shown in Table 5.5 a total of six (6) factors were extracted. The cumulative variance of these six extracted components is 77.55%, indicating an acceptable explanatory power of the factors. It can be seen from the table above that all extracted and rotated factors explain more than 10% of the variance of each variable.

Table 5.5 Extracted factors and rotated loadings

	Component					
	1	2	3	4	5	6
Org_Strat		.933				
Org_Cult		.932				
Org_Resources			.900			
Customers		.592	.514			
Suppliers			.814			
Lead_Prac				.653		
Entrepreneurship			.421	.750		
Gov_pol_EXT				.829		
Economic				.685		
Social				.444	.654	
Collaboration					.771	
Over_Reliance					.678	.438
Gov_failure						.682
Weak_Linkages						.856
Top_Manag_Support						.831
Gov_Pol_Over_Barr	.617					
Manag_Comm	.831					
Innovation	.955					
Technology					.856	
Org_Rest			.900			
Organ_St_Cul		.974				
Innov1	.846					
Innov2	.844					

***Extraction Method:** Principal Component Analysis

Rotation Method: Varimax with Kaiser Normalization

a. Rotation converged in 6 iterations.

Five items loaded onto Factor 1. All these five items relate to top management support, government or political support, management commitment, innovation outcomes. These were labelled ‘overcoming barriers to innovation’. Four items loaded onto the second factor related to employees’ perception of what they considered as the drivers to innovation in the public sector. These were labelled ‘innovation drivers’.

5.1.4 Structural equation modelling (SEM)

Quantitative data analysis was performed through the use of structural equation modelling (SEM). Hoyle’s study (cited in Smith & Smith, 2004:50) defines the structural equation model (SEM) as a comprehensive statistical approach to testing hypotheses about relations among observed and latent variables.

The choice of SEM over other statistical tools is that, firstly, SEM gives the most popular and powerful analysis of both observational and experimental data structures in the social sciences (Bagozzi & Yi, 1989:271; DeShon, 1998:412; Law, 1999:143). Secondly, SEM analysis allows the researcher to simultaneously estimate a measurement model, specifying relations between measured variables and underlying latent variables, and to specify structural relations among the latent variables (DeShon, 1998:412; Landis, Beal & Tesluk, 2000:186; Shook, Ketchen, Hult, & Kacmar, 2004:397; Ortega, Martinez & De Hoyos, 2008:44). Thirdly, SEM offers flexibility that allows the researcher to model data structures that violate traditional model assumptions (Anderson & Gerbing, 1988:411; DeShon, 1998:412). Fourthly, SEM allows for concurrent assessment of reliability and validity (Landis, Beal & Tesluk, 2000:187). Fifthly, SEM, if well employed, offers great potential for theory development and constructs’ validation as in the case of the present study (Anderson & Gerbing, 1988:422).

5.1.5 Adjustments to the study

The model can be either theory or data driven. However, in the present study the model was theory and concepts driven for structural specification. The overall data used in this study for analysis were a total of 186-sample size. The present study experienced statistical challenges for measurement and testing the model given the number of question items in the questionnaire (115) and limited data set as opposed to a larger one when using SEM. In order to overcome this discrepancy or deficiency, a number of 9 cases of the original 190 (4.7%) were discarded, because it was less than 5% of the acceptable level. Hence, this made it worse as data were lost in the analysis. Individual questions were grouped and averaged to form the observable variables. There were several observable variables for each latent construct. Therefore, 115 question items in the questionnaire were not used individually in this model. When applying SEM, it is desirable to have observable variables that are uni-dimensional and distinct from other variables. However, this was not the case with the current data set. This exacerbated the problems furthermore, resulting in numerical errors (including non-positive definiteness and Heywood cases – negative variances), when running SEM on AMOS Version 16 integrated with SPSS V 17. On the other hand, when factor analysis was performed, it became clear that there exists a great deal of overlap between different variables related to the internal and external constructs, in particular.

However, due to cross loadings of some constructs onto other constructs, it was necessary to transform the variables and rename them according to the new changes made during the testing of the structural model fit (see Tables 5.9 and 5.10). Therefore, the following variables were combined to form one construct in order to achieve both SEM and fit measure as a result of the aforementioned problems.

First, external and internal drivers are now known as ‘Innovation Drivers’ throughout the present study as indicated in Table 5.10. Secondly, observable variables that were named Organisational Culture and Organisational Strategy respectively were combined due to cross loading hence are now known as ‘Organisational Culture’. Thirdly, the same rule was applied to ‘Government’ and ‘Political’ which are

combined and renamed as ‘Political’, then fourthly Innovation Indicators were transformed into three constructs, namely, Customer Satisfaction, New Products and Intellectual Property Rights.

5.1.6 Study model fit to the data

The study model tests were based on the covariance matrix using Maximum Likelihood Estimation (MLE). The ratio of χ^2 (410.4) to the degrees of freedom (*df*) (129) was 3.182. Since this value is >3 , it indicated that the data does not fit well with the model. However, there are limitations to this statistic, and a non-significant value may be unlikely even though the model may be a close fit to the data (Weston, 2006). Comparative Fit Index (CFI) was 0.823 and the Root Mean Square Residual Approximation (RMSEA) was 0.111.

Table 5.6 Results of model indices for CFA

Fit Indices	CFA results of Model Fit	Recommended Threshold
χ^2/df (degree of freedom)	3.182	<2 or <3
CFI	0.823	>0.95 or >0.90
RMSEA	0.111	<0.06 or <0.08

These fit values are below the minimum recommended threshold; hence we concluded that the fit is not good or even adequate. Therefore, this led to the next step of the model revisions in order to find a fit.

5.1.7 Study model measurement revision

In a situation or circumstance where the fit model is not adequate as demonstrated in Table 5.7, it has become common practice in SEM analysis to revise or modify the model by deleting parameters that are not significant, and adding parameters that improve the fit (Hox & Bechger, 1998). After making the modifications to the model, the null hypothesis that there was no improvement in the model fit is tested. A modification (respecification) was performed, since there were some Heywood cases, which indicated a

poorly specified model (Kline, 2005). This was exacerbated by a number of other problems such as small sample size and missing data. In the present study, in order to improve the model fit, a modification procedure was performed, by adding some hypothesised relations (Boomsma, 2000; Weston & Gore, 2006). Therefore, after examining the modification indices, it was evident that the fit can be improved with the addition of 3 double arrowed paths, indicating that a correlation exists between the joined variable errors including: organisation strategy / culture; organisational resources / suppliers; and government / political (OB) and top management (OB).

It was found that Chi-squared (χ^2) (410.4-268.0) = 142.4 with associated change in degrees of freedom (df) (129-126=3) is significant ($p < 0.001$), thus indicating an improvement in the model. This overall improvement on the model led to a new measurement model (standardised estimates shown on Table 5.7). The fit indices for this modified model are; Chi-square / df = 2.217; CFI = 0.911; and RMSEA = 0.080 (0.067; 0.93, $p < 0.0005$).

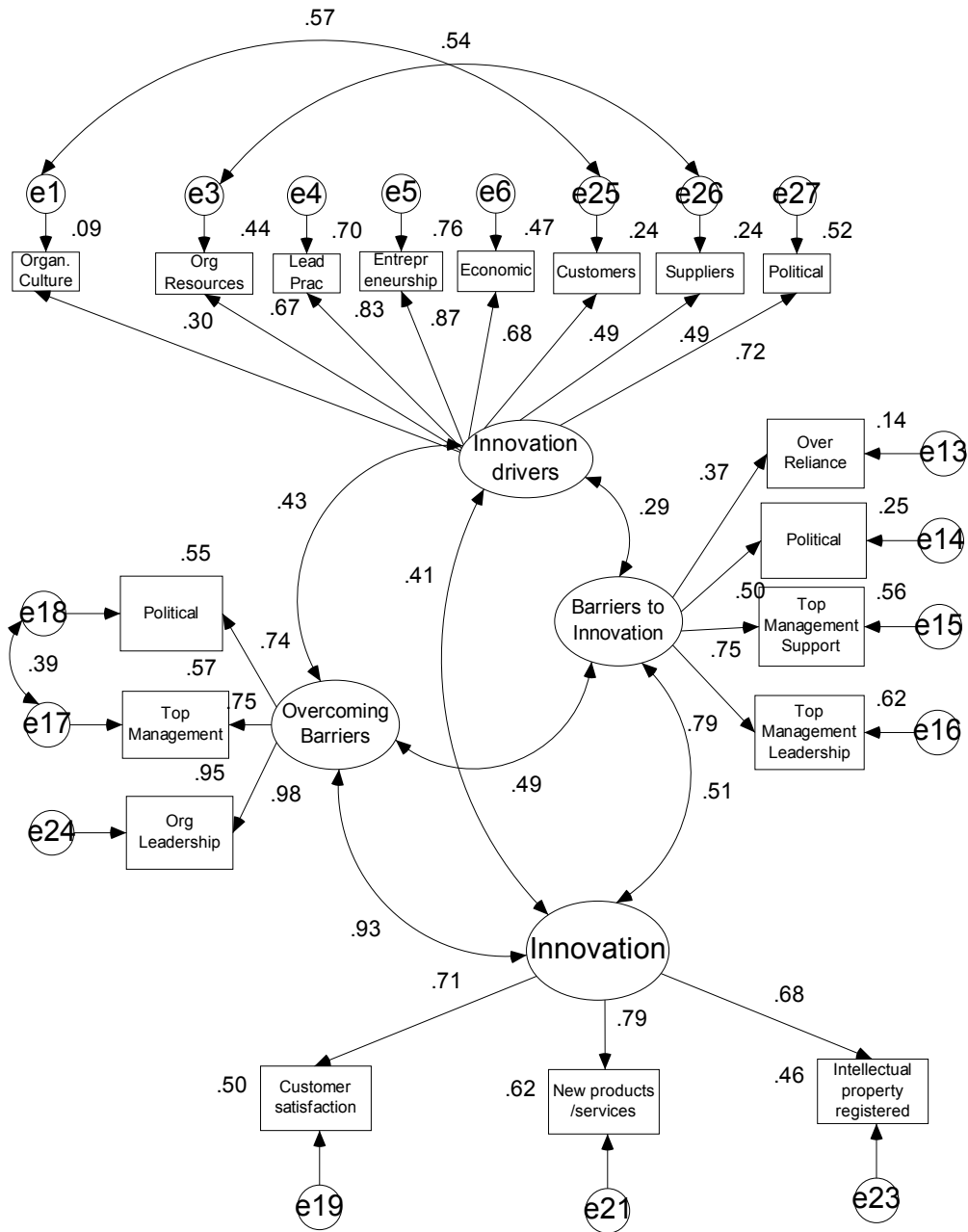
Table 5.7 Results of the revised model fit indices

Model Fit Indices	Values
χ^2 / df (degrees of freedom)	2.17
CFI	0.911
RMSEA	0.08

These results above gave an adequate fit, therefore were retained as part of SEM analysis.

Figure 5.1 summarises individual parameters estimates and their reliability.

Figure 5.9 Measurement model



It is necessary to examine the individual parameter estimates and their reliability. There are a number of ways of doing this; however in the present study the criterion used by Park (2003:55) was followed to test the structural measurement model. The estimated standardised loadings and the reliability of each measured variable is summarised in Table 5.8.

Table 5.8 Factor model loadings for measurement model

Factor/Variable		Standardised loading	Reliability
Internal/External	Org Strategy/Culture	0.300*	0.090
	Org Resources	0.665*	0.442
	Leadership Practices	0.834*	0.696
	Entrepreneurship	0.872*	0.760
	Economic	0.682*	0.465
	Customers	0.486*	0.236
	Suppliers	0.486*	0.236
	Govt./Political	0.720*	0.518
	Over reliance	0.373*	0.139
Barriers to Innovation	Government failure	0.503*	0.253
	Top Management support	0.752*	0.566
	Top management leadership	0.790*	0.624
	Political	0.742*	0.551
Overcoming barriers	Top management	0.754*	0.569
	Organisational leadership	0.977*	0.955
	Customer satisfaction	0.706*	0.498
Innovation	New products/ services	0.790*	0.624
	Intellectual property registered	0.681*	0.464

* Indicates significant at $p < .01$ level

Table 5.8 above indicates the results of estimated loadings reflecting the validity of each observed variable as a measure of the latent variable. The results of the standardised loadings were reasonably high and all are statistically significant ($p = 0.01$); the standard loadings ranged from 0.300* to 0.977*. The reliability of each of the observed variables as a measure of the latent variable indicated by the R^2 for each observed variable ranged from 0.090 to 0.955. This explained a good number of item variance 0.300 to 0.977. However, some

measures were too low as seen in Table 5.8 above, for example, 0.090, 0.139, 0.236, and 0.253. It is recommended that these loadings should be at least 0.5 and above.

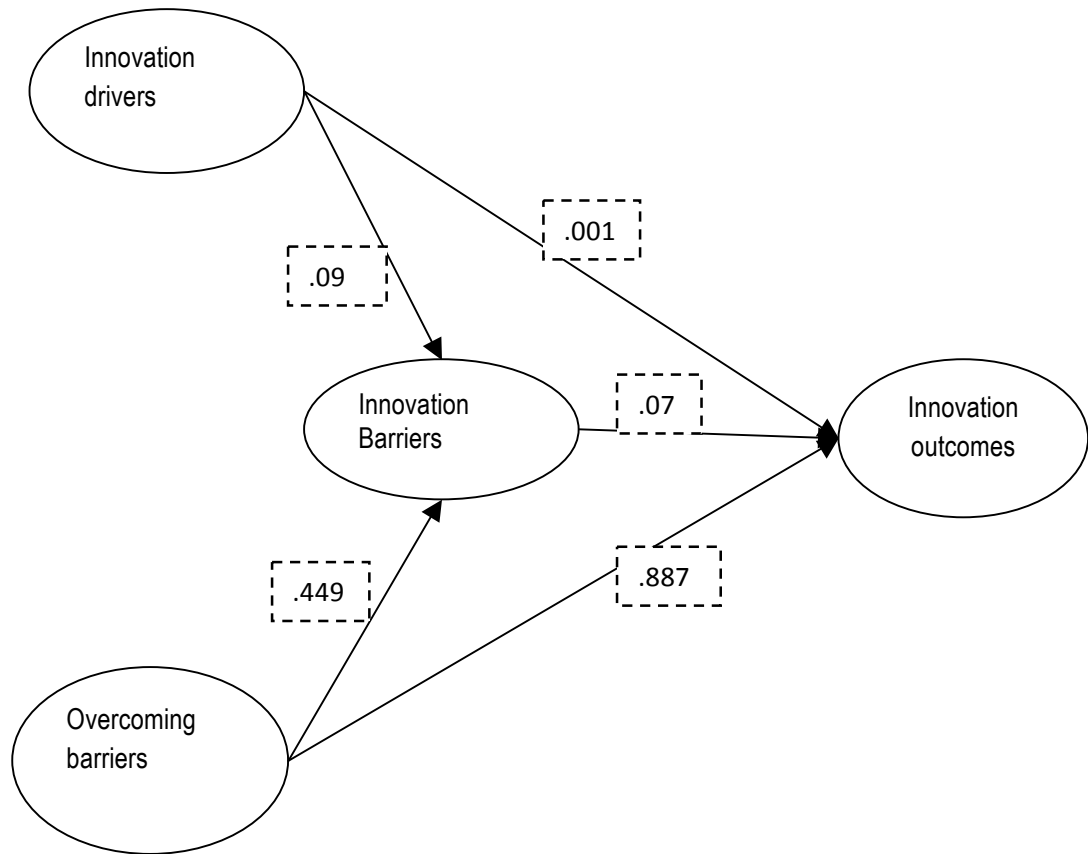
These results were very much identical to those obtained from the Confirmatory Factor Analysis (CFA) in Table 5.8. The estimated loadings indicate the validity of each observed variable as a measure of the latent variable with which it is associated, and were high and all statistically significant ($p = 0.01$); only a few having low values (org Strategy/culture 0.3 and overreliance 0.37 with reliability of 0.090 and 0.137 respectively). The reliability of each observed variable, as a measure of the latent variable, were all positive and ranged from (0.09 to 0.955) consistent with the expectations of this study.

Table 5.9 Factor correlations

	Innovation drivers	Barriers	Overcoming Barriers	Innovation
Innovation drivers	1.00			
Barriers	0.29	1.00		
Overcoming Barriers	0.43	0.49	1.00	
Innovation	0.41	0.51	0.93	1.00

Table 5.9 above represents the results of the estimated correlations among the variables ranging from 0.29 to 0.93. All the estimated correlations were positive and consistent with the expectations of the present study.

Figure 5.10 Estimated standardised direct effects for the revised model



The results of the final revised study model are summarised as shown in the Figure 5.2 above with the estimated standardised direct relationships among the latent variables. Out of the five, only two paths from overcoming barriers to barriers, and overcoming barriers to innovation were statistically significant at 0.449* and 0.887* respectively. These barriers are seen to be intervening between the drivers and innovation activities, which ultimately have positive or negative impact on the overall innovation outcomes. In the study model, a link was first developed direct and mediating variables for the relationship between the drivers, barriers, innovation activities, overcoming barriers and innovation outcomes. Innovation barriers intervene between innovation drivers, which affect the rate of innovation activities resulting in high or low innovation outcomes. In the current study, the results of the structural model with standardised estimates have stronger relationships between overcoming barriers and innovation outcomes, and it is also worth noting that all

proposed parameters were all significant and in the expected direction. Table 5.10 below summarised the research hypotheses and corresponding causal effects implied by the study model. The relationships in the table only indicate direct relationships of the latent variables and their hypotheses, which are coded *H1 – H6*.

Path analysis techniques were applied in order to determine the relationships of independent variables with innovation outcomes (Valencia, Valle & Jiménez, 2010). Path analysis is a multivariate technique that is used to describe both direct and indirect relationship to the dependable variable. The direct relationships equal beta coefficients in multiple regression analysis. Indirect relationships equal multiplying path analysis coefficients of all the variables in a path that leads to a dependent variable (innovation outcomes).

The hypotheses tested in the present thesis were developed from the literature and theories as indicated in Chapter 2 of this study. Table 5.10 below indicates the variables, hypotheses and corresponding relationships.

Table 5.10 Variables, hypotheses, and corresponding relationships

Variables	Hypotheses	Total relationships
INNOVATION DRIVERS	H1: Innovation drivers are directly positively related to innovation indicators	0.001
	H2: Innovation drivers are positively related to innovation indicators mediated by barriers	0.007
OVERCOMING BARRIERS	H3: Overcoming barriers are positively related to barriers	0.449*
	H4: Overcoming barriers are positively related to innovation indicators mediated by barriers	0.035
	H6: Overcoming barriers are positively related to Innovation indicators	0.887*
BARRIERS TO INNOVATION	H5: Barriers are directly negatively related to innovation indicators	0.077

* Statistically significant at $p = 0.01$

Table 5.11 below indicates the standardised direct, indirect and total relationships, with corresponding hypotheses, as implied by the model. On one hand, the relationships that exist in the table below indicate total effects as sum of direct and indirect effects. On the other hand, indirect effects indicate relationships that the effect one variable has on the other mediated variables.

Table 5.11 Standardised causal effects for the final study model

Outcome	Determinant	Relationships		
		Direct	Indirect	Total
BARRIERS	Innovation drivers	0.096 (H2)		0.096
	Overcoming barriers	0.449*(H3)		0.449*
INNOVATION INDICATORS	Innovation drivers	0.001(H1)	0.007 (H7)	0.008
	Barriers	0.077(H5)		0.077
	Overcoming barriers	0.887*(H6)	0.035(H4)	0.922*

* Statistically significant at $p = 0.01$

Table 5.11 above indicates the standardised direct, indirect and total effects, with corresponding hypotheses, as implied by the model. The relationships that exist in the table below indicate total effects as the sum of direct and indirect effects. On the other hand, indirect effects indicate relationships that the effect one variable has on the other mediated variables. Therefore, overcoming barriers mediated by barriers to innovation outcomes has significant relationships with innovation outcomes 0.922, $p = 0.01$. Followed by overcoming barriers mediated by barriers to innovation outcomes 0.449, $p = 0.01$.

5.2 TEST OF HYPOTHESES AND INTERPRETATIONS

After data analysis, the results of various hypotheses of the study based on the structural model in Chapter 2, fit are reported as follows. The low and not significant estimates of these constructs are interpreted despite the slight misfit of the initial model.

5.2.1 Direct relationships

The model outcomes indicate that the determinant (innovation drivers) had the lowest direct relationship (0.001) at $\alpha = 0.01$ level which indicates that there is a non-significant direct relationship between innovation outcomes / indicators. On the other hand, the determinant (innovation drivers) was found to have a non-significant direct relationship to the determinant (innovation barriers) (0.096). The determinant (innovation drivers) also was found to be non-significant directly related to innovation barriers. Determinant (overcoming barriers) to innovation had a significant direct positively causal effect (0.449*) at $\alpha = 0.01$ on innovation barriers. Approximately 20.1% of variance of overcoming barriers to barriers was explained by the determinant. The determinant innovation barriers had non-significant direct relationship to innovation outcomes / indicators (0.077). The largest determinant with direct positive significant relationship in this study was overcoming barriers to innovation (0.887*) at $\alpha = 0.01$. Approximately 78.67% of the variance of overcoming barriers to innovation was explained by the determinant.

5.2.2 Indirect relationships

Determinant, innovation drivers had no relationship (0.008) to innovation indicators / barriers; this is due to largely indirect relationship of (0.007). This was followed by determinant, overcoming barriers, which had indirect relationship (0.922*), this was largely due to indirect relationship (0.035). The rest of the determinants had non-significant relationship to innovation outcomes / indicators.

5.3 RESULTS OF REGRESSION ANALYSIS

In the previous section, the structural model as indicated in Chapter 2, was tested using SEM. The results of SEM analysis, revealed a model that did not fit the data well, and could only be described as adequate model fit. As a result of the failure to get a good fit model, the present study adopted multiple regression analyses as a way to further confirm and reinforce the findings of the study. However, it should be noted that the analyses

of the data for the present study was purely dependent upon the SEM techniques. Multiple regressions were applied to test whether factors from each of the constructs significantly predicted the dependent variable, innovation. Multiple regression analyses were performed because it was found suitable for the present analysis, since it was hypothesised that more than one independent variable explained the variance in dependent variable.

5.3.1 Internal factors

Multiple regressions were used to test if the internal factors significantly predicted innovation. The results of the regression indicated that the internal factors explained 13.1% of the variance ($R^2 = .131$, $F(7,169) = 3.634$, $p = .001$). It was found that the only factor that significantly predicted innovation was leadership practices ($\beta = .274$, $p = 0.021$).

5.3.2 External factors

Multiple regressions were used to test if the external factors significantly predicted innovation. The results of the regression indicated that the external factors explained 9.3% of the variance ($R^2 = .093$, $F(5,171) = 3.489$, $p = .005$). It was found that the two factors that significantly predicted innovation were social ($\beta = -.190$, $p = 0.043$) and technology ($\beta = .209$, $p = 0.026$).

5.4 BARRIERS TO INNOVATION

Multiple regressions were used to test if the barriers to innovation significantly predicted innovation. The results of the regressions indicated that the barriers explained 20.2% of the variance ($R^2 = .202$, $F(4,172) = 10.910$, $p < 0.0005$). It was found that top management leadership ($\beta = .370$, $p < 0.0005$) and over-reliance ($\beta = .218$, $p = 0.003$) significantly predicted innovation.

5.5 OVERCOMING BARRIERS

Multiple regressions were used to test if overcoming barriers significantly predicted innovation. The results of the regression indicated that overcoming barriers explained 63.2% of the variance ($R^2 = 0.632$, $F(3,173) = 99.238$, $p < 0.0005$). It was found that only organisational leadership significantly predicted innovation ($\beta = 0.780$, $p < 0.0005$).

From the regression analyses above, the present study can now conclusively state that both results of SEM and regression analyses confirmed the common variables, namely: organisational leadership, top management practices, over-reliance on existing natural resources and technology as the main predictors of innovation.

5.6 QUALITATIVE RESULTS

In Chapter 4, the study indicated the integration of qualitative data to support the results of quantitative data. Incorporation of the qualitative method was informed first by the desire to gain knowledge about emerging issues on PSOs innovation, and secondly, better understanding of subtle drivers, indicators, strategies of overcoming barriers and barriers of innovation which could not be captured quantitatively. Lastly, since FGD was conducted with the middle management, the data obtained from them was considered rich in information just as much as the data collected quantitatively from the general employees category.

Qualitative data analysis requires organisation of information and data reduction. In the present study, qualitative data were reduced through categorisation along thematic line. The data may suggest categories of characterising information that may call for comparison to be made with initial research objectives or theories. Qualitative data often produce large quantities of descriptive information from field notes or discussions. Therefore the information gathered through focus group discussions was organised in order to reduce the data so that only very critical factors were retained. This process is referred to as coding (Kelly, 2014:324). The coding was done along themes from the focus interviews with the participants. The analysis

of the text involved several tasks, namely discovering themes and sub-themes, winnowing themes to the manageable few (i.e. deciding which themes are important in the research) based on the repetitions, building hierarchies of themes or codebooks, and linking themes into a theoretical model (Ryan and Bernard, 2003:85). The responses were organised under the following themes: innovation definition, or concepts, which was to capture participants' knowledge of the definition of innovation concepts; innovation drivers, not innovative, slightly innovative, highly innovative and barriers to innovation are some of the themes that were used to analyse and categorise the responses. Appendix 5 shows the pre-determined FGD questions and the type of the information sought. Probing where necessary in order to get deeper meaning from them followed the FGD responses. The results of the FGD analyses are discussed in the following paragraphs.

Participants' knowledge of innovation

The first question the participants were asked was to find out if they knew the topic under investigation as applicable to their own organisation. This was done to gain a common understanding of the concept being studied, since innovation means different things to different individuals or organisations. The first respondent used more than one word to explain the innovation concept. The respondent said, *'innovation means doing things different or new things, and being creative when doing work.'* Participants were asked if among them there is someone with divergent views different from the one the first respondent gave regarding the topic innovation. However, the participants were in agreement with the first respondent's views of the innovation concept. This question and the response from the participants were very important in the first place because it cleared any confusion that could have surrounded the concept of innovation among the participants. The participants' understanding of innovation concept was consistent with the popular concept in the literature.

Drivers of innovation

The second category question was to address the drivers of innovation. The responses to this question by the two groups of FGD, were strikingly similar. One respondent from the first group had this to say, *'We innovate in order to satisfy our customers, such as to meet their expectations.'* On the other hand, one

respondent from the second group said, *'you have to innovate to remain relevant in the market.'* Some other responses are summarised in Appendix 6.

Barriers / Challenges to innovation

The third category question was about the barriers or challenges faced by the organisation pertaining to innovation. There were a plethora of responses as summarised in Appendix 6, however, one respondent responded by posing a question:

'How can someone innovate and the same person's ideas never recognised by management?' The respondent went on to say:

'look at the policy and see how it is rigid.'

Overcoming barriers / challenges

The fourth category question was to capture the strategies of overcoming the challenges identified in the third category. Two respondents responded as follows; the first respondent said, *'change policy'* and the second, *'change the bureaucracy and procedures.'* *'Creation of a department to coordinate innovation activities,'* says one respondent. The last category question was to find out whether participants could highlight what they consider in their organisation as innovation indicators or outcomes/measurement Two groups responded similarly in this question, mentioning innovation indicators as *'customers' satisfaction,' 'patent rights and intellectual property rights.'* One respondent from one group said, *'improvement on overall performance.'*

Projects not completed due to lack of fund, says another participant.

Closing question on innovation

The closing question was open to solicit their responses. The question asked for anyone who has any other view or holds different views apart from the ones expressed by their colleagues previously. Interestingly enough, all the respondents both in the two groups at a different time of interview gave similar responses as summarised in the Appendix 6.

5.7 SUMMARY OF THE KEY RESULTS

The present study utilised quantitative and qualitative data collected from 182 employees of Kenya's public sector organisations. It was determined how well the mean (M) and standard deviations (SD) represented the data set. The results indicated that the overall mean and standard deviations of all the items (23 items), ranged from 3.35 (0.71) and 4.17 (1.01) respectively. The overall results of descriptive statistics indicated significant higher ratings, implying how well the respondent answered the questions in a distributive manner. Similarly, the reliability of the items (23 items) was calculated using Cronbach's alpha, and the results of the analysis indicated Cronbach's alpha ranging from 0.75 to 0.916. The results of the reliability were all above the recommended threshold of 0.7 (Helmle, Botero & Seibold, 2014:118).

Sample adequacy was analysed using KMO and Bartlett's Test of Sphericity. The measure of Test of Sphericity was 0.685, which was above the recommended minimum threshold of 0.6 (Pallant, 2011). Bartlett's Test of Sphericity was significant at $p - \text{value} = 0.000$, approximately $X^2 = 6119.680$, and $df = 253$. These results implied the suitability of the analysis for the variables being investigated in the context of the present study. In all, both KMO and Bartlett's statistics indicated that factor analysis could be performed. Principal Component Analysis (PCA) was performed to examine the interrelations among set of variables to identify the underlying structure of those variables. The results confirmed that a number of items shared some common variance with other items. A total of six (6) extracted components had 77.55% indicating a good

explanatory cumulative power of the factors. All the extracted and rotated factors explained more than 10% of the variance of each variable.

However, due to cross loadings of some constructs onto others, variables were transformed and renamed as follow: 'internal' and 'external drivers' were transformed and renamed 'innovation drivers', 'organisation strategy' and 'organisation culture' transformed and renamed 'organisation culture', variables 'government' and 'political' were transformed and known as 'political', and, lastly innovation indicators were transformed into three constructs, namely, 'customer satisfaction', 'new products' and intellectual property rights.

Innovation drivers, barriers, overcoming barriers and innovation outcomes were analysed using SEM analyses. The results of the hypothesised relationships among the variables are summarised. The model tests were based on the covariance matrix using Maximum Likelihood Estimation (MLE). The ratio of X^2 (410.4) to the degree of freedom (df) (129) = 3.18. Since the value is more than 3.18, this indicates data do not fit well with the model. The fit was not good; hence the study proceeded with the model revision.

After the revision, Chi-squared (X^2) ($410.4 - 268.0 = 142.4$) with associated change in degrees of freedom (df) ($129 - 126 = 3$) was found to be significant ($p < 0.001$), indicating an improvement in the model. The new fit indices for the revised model are: Chi-square / $df = 2.217$; CFI = 0.911; and RMSEA = 0.080 (0.067; 0.93. $p < 0.0005$). The above results gave adequate fit, hence were retained as part of SEM analysis. The individual parameters (path analysis) estimates and their reliability ranged from the lowest of 0.09 to the highest of 0.98, and their factor loading ranged from the lowest value of 0.300 to 0.977 respectively. All these loadings were statistically significant ($p = 0.01$).

The factor correlations were as follow: Innovation drivers to barriers = 0.29; innovation drivers to overcoming barriers = 0.43; innovation drivers to barriers = 0.41; overcoming barriers to barriers = 0.49; barriers to innovation outcomes = 0.51; and overcoming barriers to innovation outcomes = 0.93.

Final structural study model measurement

Of all the four latent variables (drivers, barriers, innovation outcomes, overcoming barriers) only overcoming barriers to innovation outcomes and overcoming barriers to barriers to innovation were statistically significant at 0.449 and 0.887 ($p = 0.01$) respectively, and accounting for 20.1% and 78.67% variances. Overcoming barriers had indirect relationship mediated by the barriers to innovation-to-innovation outcomes at 0.922, and the rest had insignificant effects.

Regression Results

Internal factors

Multiple regression analyses were performed to confirm and reinforce the SEM results on the variables. Internal factors explained 13.1% variance at ($R^2 = 0.131$, $F(7,169) = 3.634$, $p = 0.001$), only variable leadership practices significantly predicted innovation outcomes ($\beta = 0.274$, $p = 0.021$).

External factors

The results of the regression analyses indicated that external factors explained 9.3% of the variance ($R^2 = 0.093$, $F(5,171) = 3.489$, $p = 0.005$), only two factors significantly predicted innovation outcomes; social ($\beta = -0.190$, $p = 0.043$), and technology ($\beta = 0.209$, $p = 0.026$).

Barriers to innovation

The results of the regression analyses indicated that barriers to innovation explained 20.2% of the variance ($R^2 = 0.202$, $F(4,172) = 10.910$, $p < 0.0005$). Top management leadership ($\beta = 0.370$, $p < 0.0005$) and over-reliance on existing resources ($\beta = 0.218$, $p = 0.003$) significantly predicted innovation.

Overcoming barriers

Multiple regression analyses indicated that ‘overcoming barriers’ explained 63.2% of the variance ($\beta = 0.632$, $F(3,173) = 99.238$, $p < 0.0005$), showing leadership as significantly predicted innovation ($R^2 = 0.780$, $p < 0.0005$).

Thematic results (Appendix 5) of the FGD with managers revealed that managers are aware of the concept of innovation. Factors seen as driving innovation in Kenya’s public sector organisations were: Policy, networking, collaboration, adequate funding, and partnerships with universities amongst others. As one respondent says, *‘we innovate to remain relevant in the market’*. On the other hand, the results revealed that barriers to innovation are: Budget constraint, political interference, no incentive for innovation, inadequate rewards, and rigid policy. *‘Look at the policy and see how it is rigid,’* says one respondent. Another respondent remarked, *‘how can someone innovate and the same person’s ideas never gets recognised?’*

The results also show that overcoming barriers to innovation in Kenya’s public sector organisations are: incentives for innovators, mentorship, promotion of employees with good ideas, collaboration, policy change, partnerships, and networking amongst others.

‘Creation of a department to coordinate innovation activities,’ says one respondent. On the other hand, innovation indicators / outcomes identified were: number of patents registered, improvement in service delivery, customer satisfaction, and intellectual property rights. One respondent says, *‘improvement on overall performance’*. Regarding the status of innovation in the Kenya’s public sector, the respondent indicated that IT is not working properly. One respondent says, *‘not much documentation about innovation activities in the organisation’*. Another says, *‘projects not completed due to lack fund’*.

In the context of Kenya, the present study results seem to have bearing on innovation in the public sector organisations. It is worth noting that these empirical results are similar to the SWOT analysis conducted in the surveyed organisations.

In the next Chapter, the results (quantitative and qualitative) obtained in chapter 5 based on the objectives, research questions, conceptual framework and hypotheses are discussed, and their theoretical and practical implications are forth put forward.

CHAPTER 6 DISCUSSION OF THE FINDINGS

6.1 INTRODUCTION

This section (Chapter 6) discusses the findings of the results, research questions and the hypotheses that guided the present research. The results are discussed under themes in subsequent paragraphs, separately based on the study research questions and hypotheses.

In order to carry out this study, the following six research questions were formulated to guide the study during the investigation:

1. What is the status of innovation in Kenya's public sector organisations?
2. What are the specific organisational drivers and barriers to innovation in Kenya's public sector organisations?
3. How can innovation be assessed in Kenya's public sector organisations?
4. To what extent is the Kenyan government promoting innovation in the public sector organisations?
5. How can barriers to innovation be overcome in Kenya's public sector organisations?
6. How can innovation be improved/enhanced in Kenya's public sector organisations?
7. What innovation model / approaches are applicable to Kenya's public sector organisations?

The present study adopted triangulation approach to collect and analyse data as indicated in chapter 4. Quantitative data were collected from 181 employees from three organisations, while on the other hand the qualitative data were collected through Focus Group Discussions (FGD) involving 16 middle managers. The triangulation approach was employed to validate the quantitative technique and for corroborating the results of the quantitative. The results of the two approaches are discussed in the following paragraphs.

Apart from the research objectives and hypotheses for the study, the purpose of the present study was, amongst others, to develop a model for public sector innovation. The present research, for the purposes of discussion, begins first with the variables (innovation drivers) based on the results of regression analyses and SEM analysis.

H1- Internal factors are statistically significantly directly positively related to innovation indicators.

The first hypothesis (H1) was tested to find out whether there was a statistically positive direct relationship between drivers and innovation outcomes/indicators. The results were not statistically significant as was expected in the present study.

H2- Internal factors are not statistically significantly related to innovation indicators mediated by barriers.

The second hypothesis (H2) was to find out if innovation drivers have statistically positive relationship to innovation barriers on the innovation outcomes/indicators. The results indicated a not significant positive relationship between the drivers and barriers to the innovation outcomes/indicators as was hypothesised in the present research.

H3- Overcoming barriers are positively related to innovation indicators mediated by barriers.

The third hypothesis (H3) was to examine if the overcoming barriers are statistically positively related to barriers to innovation. The results of the SEM analysis indicated statistically significant positive effects as was hypothesised earlier in the study. The results supported this hypothesis.

H4- External factors are not statistically significantly directly related to innovation outcomes mediated by innovation barriers.

The fourth hypothesis H4 of the present study was not supported as hypothesised. For example, hypothesis H4 was to find out if overcoming barriers has a significant relationship with innovation outcomes mediated by barriers. This was not supported since the results were not significant. Hence, hypothesis H4 was not supported as was anticipated in the present research.

H5- External factors are statistically significantly directly related to innovation outcomes.

Hypothesis H5 was to determine if barriers to innovation had direct negative relationship between the innovation outcomes/indicators, however, as was the case with other hypotheses of the study, there was no statistically direct relationship between barriers and innovation outcomes as was hypothesised.

H6- Barriers are statistically significantly negatively directly related to innovation indicators.

The last hypothesis H6 was to find out whether there exists a statistically positive direct relationship between overcoming barriers to innovation and innovation outcomes/indicators. In this hypothesis, this assumption was supported. The results indicated a statistically significantly positive direct relationship as hypothesised.

The results of this study were first interpreted separately using the hypotheses, and thereafter jointly through Focus Group Discussion (FGD) with the managers. It should be noted here that construct innovation drivers and barriers did not satisfy statistical requirements, hence could not be discussed separately. On the other hand, constructs overcoming barriers, innovation outcomes / indicators are herein discussed separately.

In this study, all the organisation constructs were measured within the three organisations namely, The Ministry of Regional Development Authorities (MORDA) that oversees the operations and functions of the other two PSOs organisations, Lake Basin Development Authority (LBDA), and Kerio Valley Development Authority (KVDA). The Ministry of Regional Development Authorities is the mother ministry hence the three organisations have similar structures and systems that have bearing on variance that could have influence on innovation in the public sector.

6.2 STATUS OF INNOVATION IN THE KENYAN PUBLIC SECTOR

The first research question was, “what is the status of public sector innovation in Kenya?” This research question was answered qualitatively through Focus Group Discussions (FGD) with the middle managers that participated in the interviews. The responses from the FGD were as follows: “not much is documented about the PSOs innovation”, “IT services are not functioning properly”, and “projects are sometimes incomplete”. One respondent responded, *“how can organisation innovate, while employees’ ideas are never recognised by the top management?”* Reward systems were mentioned as another factor, which has made the organisation to lose technically qualified staff to the private sector. Employees also felt that the organisations have failed to create an enabling work environment that can foster innovation, due to rigidity in the policy in operations. Other factors mentioned also included lack of IT capabilities, lack of motivation, political interference and fading and overreliance on donors.

In addition, the FGD was categorical on the issue of research and development (R&D), collaboration and networking which, they said, was critical to innovation yet not much has been done by the organisation to pursue such rigorously. No documentation was available on innovation activities to enable the researcher to gauge the level of innovation in the sampled public sector organisations. In concluding, the FGD were unanimous that the incapacity to innovate is evidenced by non-completion of projects amongst other factors. The results of FGD indicated inadequate priority in the fundamental activities that are perceived as precursors to innovation.

6.2.1 Innovation drivers

To answer the research question “What are the specific organisational drivers to innovation in Kenya’s public sector organisations?” The first construct under this question was analysed using regression analyses, SEM and finally FGD. In the FGD, the following factors were considered to be innovation drivers: policy, networking and collaboration, partnership with universities and adequate funding, which was consistent with earlier studies (Laforet, 2011; Lopez & Esteves, 2011; Park, Amano & Moon, 2012; Russo-Spena & Mele, 2012) on public sector innovation. In addition to FGD findings, regression analyses results indicate leadership practices, response to social factors, and technology as innovation drivers. These results are consistent with earlier studies (Lopez & Esteves, 2011; Vigoda-Gadot & Meiri, 2008) that found transformational, top management, leadership support as crucial for creating an enabling innovative environment.

The results of these constructs have been discussed jointly due to failure to meet statistical requirements. Construct, Innovation Drivers, was measured by organisational culture, organisational resources, leadership practices, entrepreneurship, economic, customers, suppliers and political factors. In SEM analysis, the results for these were found to have a non-significant direct positive influence on Innovation Outcomes/ Indicators. These results were not only inconsistent with the previous studies (Agolla & Van Lill, 2013), but also were contradicted by the current study using Focus Group Discussions (FGD).

Policy – The results of FGD indicated policy as one of the driver to innovation in the public sector. The results of FGD is consistent with previous studies (Conteh, 2012:467; Wainwright & Shaw, 2013:279), which stated that the state (government) can systematically use policy instruments to encourage the development and application of knowledge across sectors in ways that encourage the adaptation or improvements of products, processes and services. Given that the state is directly responsible for the structure and operations of the public sector, it can formulate policies that could fuel innovative activities not only in the public sector, but also across entire sectors in the economy. That way, the state would be creating an enabling competitive environment where both sectors (public, private and not-for-profit) organisations are forced to play on equal levelled ground. Studies (Choi & Park, 2014:968; Conteh, 2012:470) suggest that most states (governments) currently use policy initiatives for regional economic development, where such policies are geared towards collaborative governance of innovation policy involving various levels of jurisdiction, along with inclusion of domestic and international and non-governmental stakeholders. Alternatively, it can be argued that policy can also hinder the capacity of the public sector to innovate, particular if such policies are considered as inadequate in addressing sharing of ideas, resources and power across levels of government and outside government. The SWOT analysis conducted in Chapter 1 corroborated the current study findings, which showed that the Ministry's regional development policy is not well aligned with the existing legal framework and needs to be reviewed. This is a further attestation that policy framework can drive or hinder innovation depending on how the state viewed itself in the light of innovation nuances.

As one respondent put it:

'Look at the policy and see how it is rigid'. (page170).

Networking and collaboration – At present, the results of the FGD showed that networking and collaboration with various stakeholders is very crucial in fostering innovation in the public sector. This finding is very consistent with studies (Agolla & Van Lill, Kallio & Lappalainen, 2015:157; Ozer, Demikran & Gokalp, 2013:290), which state that practical networking and collaboration experiment in the network, the organisation's capacity to innovatively learn 'how to learn' seemed to be fostered. Network and collaboration involve organisation partnerships in various chains of links with other sectors in the economy (private, not-

for-profit, customers, suppliers etc.) in creating a knowledge pool as a result of such linkages. These types of knowledge pools generated through such links if implemented by public sector managers can result in innovative solutions to society's problems (see, Reynoso, Kandampully, Fan & Paulose, 2015:158). In the study's SWOT analysis (page 16), it is clear that there is a public private sector partnership policy in place, which stipulates how partnerships are regulated.

As one respondent put it:

'Change policy'. (page 170)

Studies (Hilfigers & Ihl, 2010:83; Lee, Hwang & Choi, 2012:150) have shown that more and more governments are now developing open innovation policies to bring together partners with specific capabilities and integrate their contributions. For example, Hilgers and Ihl (2010:83) state that bureaucratic culture that has long been associated with the public sector, based on legal chain of command and control and closed boundaries have to be moved towards cultivating permeable edges, fostering power-sharing and free interaction between groups and individuals inside and outside the public sector organisations. In fact, another good example can be taken from the Centre for Public Service Innovation (CPSI), South Africa, where CPSI promotes innovation in government by facilitating engagement between public, private and non-governmental organisations (Lee, Hwang & Choi, 2012:156). This type of network and collaboration has made South Africa gain a reputation in the area of public sector innovation.

Partnership with universities – The respondents unanimously agreed that public sector partnerships with universities could foster innovation. The present study results are very similar to earlier studies (Lee, Hwang & Choi, 2012:156). In their studies, researchers (Ozer, Demirkran & Gokalp, 2013:300; Proctor, 2013:180) found that partnerships between the public sector and universities can create opportunities not only for new processes, products or services, but also for diffusion of innovation as the former can use such new knowledge to address society's problems. Studies (Howells, Ramlogan & Cheng, 2012:448) posit that organisations with universities/collaborations are four times more likely to engage in innovative activities than those without. In order to achieve this, the public sector can formulate policies that are supportive to such collaborative endeavours, where gains from innovation outputs are shared between the collaborators.

Adequate funding – This result is purely based on FGD and the support from the surveyed Ministry SWOT analysis. The respondents unanimously agreed that, in order to innovate, there is a need for adequate funding. They cited lack of funding as hampering many projects. As one respondent put it:

‘Projects not completed due lack of fund’. (page170).

This attests to the fact that organisation innovation capabilities are dependent on the availability of funds in order to carry out innovative projects. Kenya’s public sector organisations depend on government and development partners to fund their operations, which at times do not meet the required level.

Leadership practices – The two results (regression analyses and FGD) found leadership practices as a critical driver to innovation in the public sector organisations, $\beta = 0.274$, $p = 0.021$. These findings are consistent with previous studies (Spicker, 2012:36), which indicated that leadership practices are important innovation drivers in the public sector. Leadership is seen as a pace setter that influence and shapes the behaviours towards positive or negative directions of the organisation goals (Wainwright & Shaw, 2013:279). In the present study, leadership in the public sector is viewed as a resources provider, motivator, source of inspirations, and opportunities seeker. Studies (Albury, 2011:230; Spicker, 2012:36) have identified crucial elements of innovative leadership practices as; encouraging staff to innovate and supporting their attempts to innovate, providing appropriate rewards for innovative ideas, being entrepreneurial, providing resources, being a change agent and strategic thinker. Innovation can only come from such leadership practices, where all members of the organisation are thirsty, exploring all the time the external environment for any available opportunities that could be turned into valuable products, services, and processes. Leadership can also be viewed from a strategic perspective; that is, leadership sets the strategic direction of the organisation and provide resources to achieve those strategic objectives. Therefore, the present study confirmed that innovation in the public sector could be fostered through appropriate leadership practices in place. However, the study cautions that such leadership practices should not just be wholly transferred directly from the private to the public sector, since the two sectors have peculiar dissimilarities that could prove a challenge to public sector organisations (Spicker, 2012:37).

Social factors – The results of both regression analyses and FGD of the present study confirmed social factors as behind the innovation in the public sector organisations, $\beta = -0.190$, $p = 0.043$. Such social factors are demography pressures, provision of quality infrastructure, security, food security, health services and better education, amongst others. Researchers (Albury, 2011:227; Reynoso *et al.*, 2015:157) identified social factors as the drivers to innovation in the public sector organisations. In their studies, they pointed out that innovation in the public sector comes into existence when public sector organisations are faced with reality such as an increased population demanding better services, or an aging population demanding better care support particularly in the developed economies. While in the developing countries like Kenya, the innovation could appear from increased demand for better education, better health services, control of outbreaks of epidemics, clean drinking water, food security, and security. To address these social challenges identified in the present study, the public sector is forced to look for innovative ways to contain and solve these problems affecting the population. In addition to the above, the Ministry SWOT analysis (page 16) indicated a high prevalence of HIV/ AIDS, high poverty levels and land tenure systems that is not supportive of effective development and management interventions in the regions where they operate. This is a typical example of how the surveyed organisations can capitalise on these challenges through innovative approaches to solve the local problems. The result is further reinforced as shown below.

As one respondent put it:

'We innovate to satisfy our customers, such as to meet their expectations'. (page 170)

The results above are not surprising, since public sector organisations are mandated to serve the society by addressing their pressing social needs or alleviating societal problems through the provisions of public values.

Technology – The present study did find technological factors as a driver to innovation in the public sector organisations, $\beta = 0.209$, $p = 0.026$. The results for the regression analyses and FGD are both consistent with the previous studies (Albury, 2011:229), which found technology as a key to innovation in the 21st Century competitive environment. The mean, standard deviations and Cronbach's alpha results were; mean (M) = 3.98; standard deviations (SD) = 0.76 and Cronbach's alpha (α) = 0.76. These measures were all impressive

as they represent items. The present result is also consistent with the surveyed Ministry's SWOT analysis, which highlighted technology as a key to successful innovation that need to be harnessed. For example, the current application of e-government by most countries has revolutionised most of the services that were in the domain of traditional public sector organisations. Such technology has proved to be serving the citizens well effectively and efficiently as most of those services can be accessed online, without necessarily having to travel distances in search for those services. Studies (Reynoso *et al.*, 2015:166) state that technology such as internet and mobile phones provide not only access to new knowledge but also products and services for rural communities, which previously relied on virtually impossible physical distribution channels.

The results of these constructs have been discussed jointly due to failure to meet statistical requirements for SEM. Construct, Innovation Drivers, was measured by organisational culture, organisational resources, entrepreneurship, economic, customers and suppliers. In SEM analysis, the results for these were found to have a non-significant direct positive influence on Innovation Outcomes/ Indicators. These results were not only inconsistent with the previous studies (Agolla & Van Lill, 2013; Johannessen, 2013), but also were contradicted by the current study using Focus Group Discussions.

One thing is notable in the current study. The contradictions in the understanding of the factors (drivers) responsible for the public sector innovation between managers and employees, who participated in this study, as demonstrated herein, should be a matter of concern for future studies. Perhaps, one possible explanation for this contradiction could be due to the fact that managers occupy senior positions in the organisations' hierarchy, and therefore have been exposed to innovation concepts, while on the other hand, employees, because of their position within the organisation structure, lack this concept. The second possible explanation that could be offered here is that, as one assumes a position of responsibility, the person is exposed to various career and skills upgrade through training and development which enhances his/her knowledge that makes a distinction between managers and employees. The third possible explanation could be that of lack of information sharing between managers and employees specifically on organisations innovation activities. Then, lastly, another possible explanation for this contradiction, could be attributable to the fact the major empirical studies on innovation have been done in the west, particularly in the developed world, therefore

innovation is a new concept that has not been conceptualised well in the developing economies, of which Kenya is not an exception (Engida & Bardill, 2013:7; Johannessen, 2011). Alternatively, given that innovation is a concept coined from the private sector, its application and concept in Kenya's public sector is still in its infancy (Engida & Bardill, 2013:7).

Despite the above registered contradiction in the two analyses, SEM and FGD, the study still found out that the mean, standard deviation and factor loadings for these factors; organisational culture, organisational resources, economic, customers and suppliers, entrepreneurship and government had a good reliability; an indication that, they measured what they ought to measure, for example, the mean for entrepreneurship, $M = 3.77$, $SD = 0.80$, and loading (0.86). On the other hand, the government had mean value and factor loading as $M = 3.73$, $SD = 0.88$, and loading (0.91) respectively. Sub-scale organisational culture had mean $M = 3.35$, $SD = 1.07$ and loading (0.93). The mean, standard deviation and factor loading for sub-scale organisational resources were; $M = 3.70$, $SD = 0.83$, and loading (0.90) respectively. Economic factor sub-scale had mean, standard deviation and factor loading as follow; $M = 3.76$, $SD = 0.71$ and loading (0.77), on the other hand, sub-scale customers had $M = 3.59$, $SD = 0.84$ and loading (0.81). The last sub-scale was suppliers which had $M = 3.44$, $SD = 0.76$, and loading (0.65). Statistically, all these sub-scale measurements had impressive and significant values, indicating that taken independently each measured drivers to innovation in the public sector organisations.

6.2.2 Innovation barriers

In order to answer the question “What are the specific organisational barriers to innovation in the public sector organisations?”, results for this question are discussed jointly using mean (M), standard deviations (SD), reliability scores (α), SEM, regression analyses, FGD and the surveyed organisations' SWOT analysis in Chapter 1 in subsequent paragraphs below. Like the previous question, first the FGD results revealed that the main barriers to innovation are:

Top management leadership – The result of SEM analysis reveals that barriers to innovation had 0.07 direct relationships with innovation outcomes. However, the mean scores, standard deviation and reliability were

very impressive, an indication that represented the scale items well ($M = 3.80$, $SD = 0.85$, and $\alpha = 0.88$). The value is non-significant, however, performing multiple regressions analyses, barriers explained 20.2% of the variance ($R^2 = 0.202$, $F(4,172) = 10.910$, $p < 0.0005$), indicating that top management leadership ($\beta = 0.370$, $p < 0.0005$) and over-reliance on exploitation of existing resources ($\beta = 0.218$, $p < 0.003$) significantly predicted innovation outcomes. The SWOT analysis and FGD supported these results. Top management leadership is viewed in the context of public sector organisations as the formal and informal rules, which affect human behaviour and interaction (Johannessen, 2013:1197; Wainwright & Shaw, 2013:277). Top management leadership is responsible for creation of norms, values and rules that shape human behaviour in a given direction. The argument here is that public sector organisations are characterised by sets of rules, policies and regulations which are very elaborate and do not create an enabling innovative environment for the employees to think outside the box. In such an environment, innovation cannot thrive since conformity and adherence to the set standards become the order of the day. Previous studies (Agolla & Van Lill, 2014; Perrikarinen, Hennala & Harmaakorpi, 2011) further point out that most public sector organisations designed to stop unfair, unpredictable and arbitrary actions by those in charge. To accomplish this, those who are in charge (top management leadership) impose rules: systematising, formalising, specifying how things should be done and ensuring uniformity across the entire organisation (Wainwright & Shaw, 2013:279). This type of top management leadership behaviour not only hinders innovation but also restrains employees from coming up with any good ideas, which is the precursor to eventual innovation.

Over-reliance on exploitation of existing resources – The findings reveal that over-reliance on the exploitation of the existing resources negatively affects innovation capabilities of the public sector organisations, $\beta = 0.218$, $p < 0.003$. Studies (Agolla & Van Lill, 2014; Murray, Gaulier-Grice & Mulgan, 2010) have shown that the public sector in most cases is very comfortable with what is known to them, as opposed to searching for new resources outside. Over-reliance on the existing resources also constrains the public sector from exploring other resources, and results in failure to add value to their innovative process (Christensen, 2006:1163). The resources here range from shortage of skilled human capital to finance, or support services that may be needed for the implementation of innovation (Manzini, 2012:7). Other studies

(Albury, 2011; Wainwright & Shaw, 2013:277) have demonstrated that innovation often requires substantial investments both in materials and human resources, therefore, when public sector organisations over-rely on the existing resources, they cannot foster or encourage innovative activities because over-reliance on the existing resources can cause serious resources depletion and soon PSOs find a shortage of them.

Lack of clear innovation policy – It was not surprising that policy featured as one of the barriers to innovation in the public sector organisations. The finding is supported by the SWOT analysis (see Chapter 1) that was performed on the surveyed organisations, which also highlighted that currently the organisations face clear policy challenges. The SWOT analysis shows that regional development policy is not well aligned with the existing legal framework and needs to be reviewed.

As one respondent put it:

‘Change the policy’. (page 170).

While another respondent remarked:

Look at the policy and see how it is rigid’.

These are clear evidence that Kenya’s public sector organisations still operate in a tight policy environment that cannot foster full innovation potentials. Sabir and Sabir (2010:220) point out that some governments have fragmented industrial policies that only confuse the state of innovation in the public sector organisations. For example, when policy is not well aligned to the existing legal framework and rarely gets reviewed, it can only confuse the organisations resulting in no innovation actions by the public sector. The present results are very consistent with earlier studies (Agolla & Van Lill, 2014).

Government / political influence – The mean scores for this factor are $M = 4.1$, $SD = 0.78$ and $\alpha = 0.75$. The result indicated that government / political influences can have a positive or negative impact on the public sector capacity to innovate. It is not surprising to find this kind of result given the nature of the study focus, that is, public sector organisations in the Kenyan context. These results are corroborated in the FGD with the 16 managers, as one respondent directly put it:

‘Political influence’. (page 170).

Another respondent: *‘Look at the policy and see how it is rigid’*.

Government / political influence come in different ways such as budget constraints, policy failure, nepotism in appointment to senior positions without merit considerations, lack of freedom to express oneself, and lack of recognition of innovative ideas as well as lack of reward for innovative behaviours. These findings are in line with the recent study (Wainwright & Shaw, 2013:279). Whereas the government should lead in spearheading reforms in the public sector, in Kenya this is not the case. The study found that there are weak macro- and micro-economic policies, unfavourable governance reforms, inadequate infrastructure development, low human resources development, as some of the challenges the sector has to deal with (MORDAs, Strategic Plan, 2008-2012). Under these circumstances, public sector organisations cannot carry out innovative activities, since this type of organisational climate does not provide such flourishing innovation environments for employees as well as the organisations. Albury (2011), for example, states that political control and bureaucratic command cultures in the public sector resist aggregation, which in turn means that renewal and refreshing mechanisms operating in other areas are weak or absent. Hence, there is a slowness of innovation diffusion in the public sector organisations. Therefore, this result bears a lot of similarities with similar studies (Ball, 2011:15; Li, 2012:76; Sun *et al.*, 2013:368) elsewhere, which found that government patronage does influence innovation public sector organisations either positively or negatively.

No rewards or incentives to innovators – This was revealed through FGD and the SWOT analysis on the surveyed organisations. This is not surprising, given the nature of remuneration and rewards systems in place in most governments owned institutions, particularly in the Kenyan context. As demonstrated in the following excerpts from the respondent who put it:

“How can someone innovate and the same person’s ideas never get recognised?”

The present study is in line with recent studies showing the role of incentives and rewards as motivators to innovate in the organisations (Albury, 2011; Engida & Bardill, 2013:7). These researchers advocate effective remuneration and reward systems to boost the morale of the public sector employees, since the sector is marred by poor salary systems and demoralised employees that cannot devote time to be creative. Similarly others (Agolla & Van Lill, 2013) further point out that public sector organisations need to have attractive

remuneration and reward systems that can attract not only quality and competent employees but also boost their morale to innovate. Poor reward systems featured in the FGD and SWOT analysis of the present study. The surveyed organisations have experienced high staff turnover among middle technical staff to the private sector, citing inadequate remuneration amongst others as the main reason for such turnover.

This qualitative result supports the earlier studies (Agolla & Van Lill, 2013) which found out that barriers negatively influenced Innovation outcomes / indicators. On the other hand, the results of the regression analysis indicate innovation barriers as: top management, leadership, and over-reliance on existing resources (Murray, Gaulier-Grice & Mulgan, 2010). Lastly, SEM results showed no significant positive influence of the factors that are barriers to innovation outcomes / indicators as was experienced with the drivers to innovation. In the subsequent paragraph, the study discusses the strategies that public sector can use to overcome barriers to innovation in the Kenyan public sector organisations.

6.2.3 Strategies to overcome barriers

To answer the research question “How can barriers to innovation in the public sector organisations be overcome?” hypothesis H3 postulated that, strategies to overcoming barriers is positively directly related to positive effects on the influence of innovation barriers ($\beta = 0.449$, $p < 0.01$) which was established and supported by the present study. This result is consistent with previous studies (Agolla & Van Lill, 2013; Park, Amano & Moon, 2012; Russo-Spena & Mele, 2012). This finding was further reinforced by the result of the FGD conducted by the managers who identified the strategies to overcome barriers as, networking, collaboration, partnerships, and creation of a department to coordinate innovation activities, change policy, incentives for innovators, mentoring innovators, and promoting employees with good ideas. However, it should be noted that, in the FGD results, other factors emerged which were not part of the SEM analysis. For example, in the present study, FGD identified other strategies which could be used to overcome innovation barriers such as the creation of a separate department to coordinate innovation activities, mentoring of innovators, promotion of employees based on innovative ideas as some of the strategies that need to be put in place to overcome barriers to public sector innovation. This response clearly demonstrates the level of

managers' understanding of innovation practices that need to be in place in order to foster and promote public sector innovation. It can be pointed out that what used to be the domain of the private sector is being absorbed by the public sector managers, who can now appreciate the important role played by innovation in the performance of the public sector organisations.

The results of regression analysis clearly indicate that to overcome barriers to public sector organisation innovation, the organisational leadership must value, and put effort in place that which is necessary to foster and encourage innovation. It is well known that leadership occupies a strategic position within the organisation, hence it is seen as an important determinant of the organisation's future in terms of direction (Wainwright & Shaw, 2013:275). Previous studies (Lee, Olson & Trimi, 2012; Sarros *et al.* 2008) indicate that organisations that are innovative tend to go for radical change in order to improve their performance; hence they use strategic leadership to achieve both innovative direction and innovative potential. From the present study, empirical evidence suggests that leadership dimensions that are crucial to leadership innovation are divergent thinking, critical thinking, technological skills, problem solving, analytical skills, strategic thinking and numerical abilities (Stewart, 2014:247; Wainwright & Shaw, 2013:275). Similarly, other studies (Agolla & Van Lill, 2013; Stewart, 2014:247) also found that leadership skills that are crucial to innovation are strategic and transformational leadership. The importance of leadership in innovation is seen in the following leadership dimensions; allocation of sufficient resources that include people, funds and time associated to sustain a specific project (Liu, 2011; Lopez & Esteves, 2011). In addition, leadership is found to be associated with the creation of an organisational climate conducive for innovation (Stewart, 2014:247). It is such favourable organisational climate that allows for the creative mind to thrive, where employees feel free to express themselves and challenge the status quo. A climate that stimulates creating thinking among the organisational members as well as leadership that recognises employees for their efforts acts like a stimulus for such workers to invest their time and energy in innovation (Agolla & Van Lill, 2013; Diefenbach, 2011).

The present study confirms what other similar studies (Lee, Olson & Trimi, 2012; Ozer, Demirkan & Gokalp, 2013) found to be innovative; good leadership removes innovation barriers such as harsh criticisms from

other organisation's members, and recognises innovative ideas, demonstrates a level of fairness and creates a shared vision for innovation (Procter, 2013). However, it should be borne in mind that these leadership dimensions which were formerly associated with the private sector's chief executives, are now found to be visible with even chief executive officers from public sector organisations. Therefore, the present study lends supports to an earlier study (Diefenbach, 2011), which advocated the adoption of some private sector practices for entrepreneurial purposes within public sector organisations.

Government/Political – To answer the question “To what extent is the government promoting innovation in the public sector organisations?” The present research results found that there is a strong association between government's roles in public sector innovation to public sector Innovation Outcomes/Indicators. Government roles identified are, formulation of friendly innovation policy, tax rebate to innovative public sector, public procurement, and provision of infrastructure that is necessary for public sector innovation.

The empirical evidence for the positive influence of government's role and innovation outcomes/ indicators is in agreement with the position of the proponents of government's role in public sector innovation outcomes (Agolla & Van Lill, 2013; OECD, 2010). In the present study the government's role can be categorised into the following; creating a legislation framework that is supportive of innovation activities, and providing much needed funds as subvention to those public sector institutions, which are innovative. Therefore, the present study results revealed a positive relationship between government's role and innovation outcomes. In order to overcome barriers to public innovation, there is need to take into account the role that the government must play specifically in areas such as policy formulation, tax rebate for innovating PSOS, public procurement for innovation and capital injection to support innovative activities within public sector organisations.

Top Management Support – The results of the present study are similar to the previous studies (Diefenbach, 2011; Lopez & Esteves, 2011; Macharia, 2010) that found organisation top management support as positively influencing public sector innovation outcomes / indicators. Other empirical studies (Diefenbach, 2011; Macharia, 2010) point out that top management support may take many forms such as how dedicated they are

towards innovation, the availability of resources and overall commitment to organisational innovation. Top management support also comes from the conceptualisation of the broader organisation's objectives and determines how the objectives will be communicated to the employees down the chain of command. This is likely to influence the organisation's members' behaviours either positively or negatively depending on their understanding and perception of the top management actions. Top management formulates the overall organisational strategy for implementing innovation through ideas generated by members a vision that must be transformed into a course of action with goals and a plan for achieving them (Wainwright & Shaw, 2013:275). Therefore, the present study points to a strong positive influence of top management support to innovation outcomes in the public sector organisations.

The next subsection discusses the findings of the innovation outcomes/indicators in Kenya's public sector organisations.

6.2.4 Innovation outcomes/indicators

The third question, "How can innovation be assessed in the public sector organisations?" This was analysed both quantitatively and qualitatively. In the quantitative analysis, the standardised loadings for the Innovation Indicators were very impressive with loadings ranging from 0.681 to 0.790 for the three variables namely: Intellectual property registered (0.681) customer satisfaction (0.706), and new products/services (0.790).

After transformation and adjustments were made as shown in Table 5.1 customer satisfaction and increase in new products / services were renamed - Innov1, and intellectual property registered renamed - Innov2. These are discussed in the subsequent paragraphs below.

Customer satisfaction and increase in new products / services (Innov1) – The mean score $M = 4.14$, $SD = 0.81$, loading (0.84). In the context of the present study, customer satisfaction and increase in new products / services are viewed as true indicators of innovation outcomes in public sector organisations. The present study results are consistent with other researches (Belkahla & Triki, 2011:653; Reynoso & Maket, 2012:270),

which suggested that the assessment of innovation could be gauged by measuring the level of customer satisfaction with the public sector organisation's services, products and processes. The customers' satisfaction is derived from the definition of innovation as the 'development of new products, services and processes' that result in the solution of their problems or meeting their needs / expectations. The public sector can measure the level of customers satisfaction through such factors as the availability of valued services, affordability and acceptable quality, ease of accessibility, transparency in the provision of such services, number of new products / services rolled out, and on-time services at the right place (Hope 2012:137; Johannessen, 2013:1205). Through such measures, public sector organisations have a better view of their innovation impacts on the citizens, and can be able to track where the services are not meeting the needs of the citizens and take corrective measures. The SEM finding is further reinforced by FGD result as this respondent put it:

"We innovate in order to satisfy our customers, such as meet their expectations".

In addition, other scholars (Belkahla & Triki, 2011:653; Johannessen, 2013:1206) pointed out that service innovation, whether tangible or intangible, involves different types of knowledge in the service process, and with results being some degree of novelty. It is argued that it is the service or product delivery and what the customer experiences that constitute value for the customer.

As another respondent put it:

"Improvement on overall performance". (page 170).

Further the present study contribution here is that the public sector needs to create a system of customer feedback incorporated in the service or product processes. When such feedback is incorporated, the subsequent services are expected to create more value than before. This kind of arrangement creates sustainable customer satisfaction and enhanced innovation capabilities of the public sector organisations. The final service or product produced with customers' feedback automatically results in maximum satisfaction to

the customers' benefit. In addition, scholars (Antikainen, Mkip & Ahonen, 2010:101) point out that involving customers more in organisation processes have the ability to lower barriers to adopting new innovations. Therefore, customers' satisfaction and development of new products are both entwined with innovation capabilities of public sector organisations.

Intellectual property registered (IPR) (Innov2) – The findings for IPR indicated higher ratings of mean score, $M = 3.93$, $SD = 0.92$, and loading (0.68). Thus the factor loading (0.68) demonstrates that IPR is an important component of innovation output. The finding is consistent with similar studies in that the number of IPRs is an indication of an innovative organisation (Sammur-Bonnici & Paroutis, 2013:927). IPR is an output of rigorous R&D carried out by individuals acting alone or organisations individually or in partnerships such as collaborations. Therefore, as organisations embark on rigorous R&D with better outputs that can be transformed into tangible services or products, such outputs are likely to attract some IPR from the owners of the new services or products or processes. Therefore, IPR arises whereby the individuals or organisations have produced new or novel products, which need to be registered in their names. However, this requires a strong IPR legal framework protection regime to guard such producers of new services from encroachment by others who may lay a claim over such IPR rights later.

The respondent said:

“Patents, and Intellectual Property Rights”.

Support for the statement above is found in recent works (Datta, Reed & Jessup, 2013:164), which argued that not only innovation needs protection but also IPRs against duplication. Evidence (Ghazal & Zulkhibri, 2015:252; McCann & Ortega-Argiles, 2013; OECD, 2010) suggests that organisations that are innovative have higher numbers of IPR, a clear indication of IPR as a measure of innovation outcomes.

In next subsection, the present study discussed the proposed innovation model as presented, and the study hypotheses revisited.

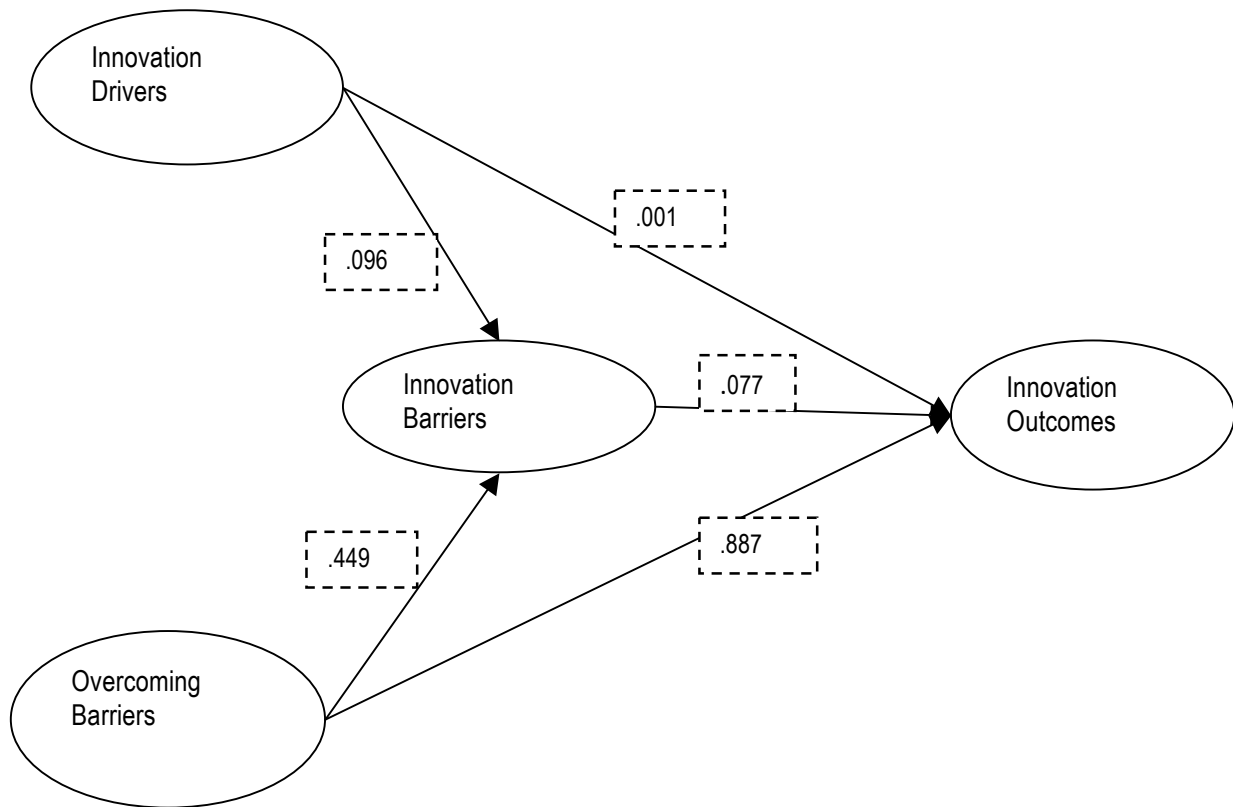
6.2.5 Innovation model for public sector

In order to answer the sixth research question, “What innovation models / approaches are applicable to the public sector organisations?” The present study developed a model based on the theory and empirically tested with survey data that could be helpful in assessing innovation in public sector organisations. The results presented in Figure 6.1 provide a detailed version of the final structural equation model. The model fit indices obtained in the present study provided an acceptable fit, which could only be described as adequate. The summary of final model fit indices is shown in the subsequent paragraph below.

6.2.6 Revised model fit indices

χ^2/df (degree of freedom) = 2.17; CFI = 0.911 and RMSEA = 0.08. These results gave adequate fit as shown in Figure 6.1. The individual parameters (paths) propose adequate fit as opposed to perfect one.

Figure 6.11 Proposed structural model



In the model above, the paths for overcoming barriers to barriers to innovation was 0.449*, $p < 0.01$ indicating that overcoming barriers have positive relationships with barriers to innovation. On the other hand, overcoming barriers have very significant positive relationships with innovation outcomes/indicators at 0.887*, at $p = 0.01$. These results indicate how important overcoming barriers are significant in the context of Kenya's public sector in enhancing innovation.

Therefore, the present study was supported by the development of a model that was found to be adequately fitting. Perhaps the non-perfect model result that was obtained could be further investigated in future research.

In the following chapter, several recommendations for future research are put forth and some implications to public policy and practice made explicit.

6.2.7 Hypotheses re-visited

The present study hypotheses were empirically tested using SEM and the results summaries are presented as follows:

H1: Innovation drivers are directly positively related to innovation indicators. This hypothesis was not empirically supported in the present study. However, there is support for it theoretically.

H2: Innovation drivers are positively related to innovation indicators. This hypothesis too was not supported. Empirically, the present study did not support the hypothesis except theoretically.

H3: Overcoming barriers are directly positively related to barriers.

This hypothesis was supported as demonstrated by the results, 0.449^* , $p < 0.01$, supporting earlier studies (Spicker, 2013; Valero, Jung & Andrew, 2015:6; Van Wart, 2013) which found that, to innovate, the public sector organisations must remove barriers that hinder their innovation capacity. Therefore, the findings of this study support the views that overcoming barriers to innovation enhances the innovative capacity of the organisations.

H4: Overcoming barriers are positively related to innovation indicators mediated by barriers. This hypothesis was not supported in the present study as was hypothesised earlier in the study.

H5: Barriers are directly negatively related to innovation indicators. In the present study, this was not supported empirically, though it should be noted that, theoretically this hypothesis is supported. The evidence (Fu & Xiong, 2011; Stankovic, 2013; Sun *et al.*, 2013) suggests that innovation barriers can hinder innovation activities depending on the magnitude and the type of barriers encountered by the organisation.

H6: Overcoming barriers are positively related to innovation indicators. There was overwhelming support for this hypothesis, 0.887^* , $p < 0.01$. This is in line with the recent studies (Li, 2012:83; Liu, 2011:253), which found that overcoming barriers have a directly positive relationship to innovation in the public sector organisations.

6.3 SUMMARY

The present study results present the drivers, barriers, overcoming barriers and innovation indicators. The findings of the present study are both empirically and theoretically supported. First, the present study had six research questions to investigate: *First*, what is the status of innovation in Kenya's public sector organisations? It was found that innovation in Kenya's public sector organisations is well documented, although some progress has been made such the adoption of e-government in some limited areas. The results are supported empirically and theoretically with the FGD as demonstrated by the following excerpts.

"Not much documented about innovation activities in the organisations". (page170)

"Projects not completed due to lack of fund", said one respondent. (page170)

It was also mentioned that IT is not working properly in most cases, signalling a lack of properly operational IT infrastructure hampering the ICTs uptake by the users both internally and externally. In addition to the FGD results, the SWOT analysis conducted in the surveyed Ministry reveals other dimensions such as; weak IT infrastructure, regional development policy not well aligned with the existing legal framework, inadequately skilled middle technical staff and low funding, amongst others. Given that organisations heavily depend on the factors mentioned above to carry out innovation activities, in the Kenyan context, public sector organisations cannot innovate effectively under such circumstances.

Second, what are the specific organisational drivers and barriers to innovation in Kenya's public sector organisations? In the Kenyan context, on one hand, the drivers to innovation in the public sector organisations were identified as: top leadership practices, policy, technology, social factors, entrepreneurship, top management practices, collaboration and networking, partnerships with universities, adequate funding, and R&D amongst others. These were both empirically and theoretically supported as some of the specific drivers to innovation in the Kenyan public sector context. On the other hand, the present study found barriers to innovation as: government/political interference, fading and over-reliance on donors, lack of IT capability, top management practices, lack of clear innovation policy, no incentives / rewards for innovators, over-

reliance on the exploitation of existing resources and lack of motivation. The surveyed organisations exhibited innovation barriers characteristics typical of public sector organisations as shown in the literature.

Third, how can innovation be assessed in Kenya's public sector organisations? In the Kenyan context of public sector organisations, the present study found that to assess innovation, the organisation must pay keen attention to the amount of money spent on research and development (R&D). However, it should be borne in mind that R&D only becomes an indicator if the outputs translate into improved or new processes, services or products, number of registered IPR by the organisation, customer satisfaction and overall improvement in organisation performance. These findings got support from the empirical and theoretical groundings as discussed in the discussion section of the present study.

Fourth, to what extent is the Kenyan government promoting innovation in the public sector organisations? In the current study it was found that the government has embarked on promotion of innovation through first putting in place, 'Kenya National Innovation Systems (KNIS) to spearhead the country towards being a middle income country by 2030. This is captured in Kenya's Vision 2030, where the government has made deliberate efforts to mainstream ICT uptake in all segments of the economy. This has since changed the innovation landscape in Kenya's public sector as most Ministries have already installed e-government for use by citizens seeking services. However, as found with the surveyed organisations, it seems this has not been embraced well, given the empirically findings of the present study.

Fifth, how can barriers to innovation be overcome in Kenya's public sector organisations? The results of the present study clearly spell out the specific strategies on how to overcome barriers to innovation in the Kenyan context as: adequate funding, top management support, government/political support, policy formulation, incentives/rewards for innovators, partnerships, and collaboration and networking. The results are consistent with the literature and empirically supported in the present study.

Sixth, what innovation model / approaches are applicable to Kenya's public sector organisations? The present study managed to propose a model of innovation in the public sector which could only be described as adequately fitting, the reason being only two paths were statistically significant. The other three paths had non-significance statistically. The proposed study model is not one of a perfect fit, however there is a

limitation to this. Scholars (Chin, Peterson & Brown, 2008) argue that there is no perfect fit model in reality and therefore a model should not be rejected simply because it is a misfit.

The present study hypotheses were empirically tested and the results show that on the one hand, the present study hypotheses H1, H2, H4, and H5 were empirically rejected, however it should be borne in mind that theoretically they were supported. Therefore, the study calls for care when rejecting or accepting the hypotheses. On the other hand, hypotheses H3 and H5 were both supported empirically and theoretically as good predictors of innovation in the public sector organisations, particularly in the context of the present study, that of Kenya's public sector. Finally, it can be concluded that the present study achieved its objectives and purpose, as set out earlier in Chapter 1 to Chapter 8.

In the next Chapter, the study discusses the implications and future research avenues areas based on the research objectives, questions, hypotheses and theoretical framework. Then it summarises all the issues encountered from Chapters 1 to 6 and their implications for the present study and future studies.

CHAPTER 7 CONCLUSION AND RESEARCH IMPLICATIONS

7.1 INTRODUCTION

This section presents the conclusions based on the previous chapters, the results of the study, and the discussions. The present study also offers contributions, recommendations and research implications for future study in the area of public sector innovation, and limitations.

The main objective of the present study was to assess the levels of innovation and to relate them to the performance and service delivery of the Ministry of Regional Development Authority in Kenya. Therefore, the specific objectives of this study were to:

1. Explore the extent to which Kenya's public sector organisations are innovative.
2. Explore the specific organisational drivers and barriers to innovation in the public sector organisations in Kenya.
3. Find out how innovation can be assessed in Kenya's public sector organisations.
4. Explore the extent to which the Kenya's government is promoting innovation in the public sector organisations.
5. Examine the specific factors that can be used to overcome barriers to innovation in Kenya's public sector organisations.
6. Explore how innovation can be improved/enhanced in Kenya's public sector organisations.
7. Develop an innovation model that is applicable to Kenya's public sector organisations.

7.2 CONCLUSIONS

The present study provided *prima facie* evidence of the antecedents of drivers, barriers, strategies to overcome barriers, and innovation outcomes/indicators within public sector organisations. The study discovered extant literature that exists in the private sector, where massive research work has been carried out

on innovation. However, such research is limited when it comes to innovation in the public sector organisations. The reason for this is the fact that the two kinds of organisations differ in many ways, which makes the direct transfer of all the concepts and applications from one sector to another difficult. Despite the differences mentioned, there is still evidence from the extant literature (Diefenbach, 2011) that some concepts and applications from the private sector may be applied with greater caution to public sector organisations (PSOs), which can yield greater results.

With increasing demand for better public welfare services, PSOs require innovation to be accountable and responsive to the needs of the general public (Bloch, Bugge & Slipersaeter, 2010:1; Khilji, Mroczkowski, & Assudani, 2012:257; Lee, Olson & Trimi, 2012:829). Today, innovation is recognised as the engine of economic growth and prosperity for a country's competitiveness, therefore innovative PSOs are likely to contribute to the country's competitive advantage through the creation of public value (Lee, Hwang & Choi, 2012). The evidence suggests that innovative PSOs can contribute to the exchequer through improved tax revenues, and support various developmental infrastructures such as the provision of clean drinking water, affordable medical care, and security of the citizens, amongst others (Roberge & Jesuit, 2012).

The study found evidence that supports PSOs innovation as: organisational leadership, top management support, government / political support, entrepreneurial activities which can be used to promote innovation in the sector. Others are the number of registered patent rights / intellectual property rights and customer satisfaction which can be used as PSOs innovation outcomes / indicators. PSOs managers can leverage these variables to encourage innovation.

In this study, a model was developed based on earlier research in the public sector, which was tested empirically using data collected from Kenya's public sector organisations' employees, middle managers and top management. The results based on structural equation modelling (SEM) seem to suggest support for overcoming barriers, innovation barriers and innovation outcomes as positively related. On the other hand,

there was no support for the relationship between innovation drivers, innovation barriers and innovation outcomes/indicators as was hypothesised.

7.3 CONTRIBUTIONS OF THE THESIS

From the onset, the promise was that this study would contribute to the existing body of knowledge, contribute to management practice, contribute to innovation, contribute by developing an innovation model for Kenya's public sector organisations and, finally, open an avenue for future research into public sector innovation. Therefore, the present thesis summarises such contributions under the following headings:

7.3.1 Contributions to literature

The present study contributes to the public sector innovation literature through an integrated model that was empirically (see Chapter 2) developed and tested using different research streams, specifically, innovation in the public sector that has long received less attention from researchers. In addition, the theoretical concepts, the development and testing of measurement instruments in the current study could prove useful to public sector innovation research. The measures of constructs, innovation drivers, innovation barriers, strategies to overcoming barriers and innovation outcomes/indicators were carefully crafted to capture the peculiarities of the public sector. The literature consist of most seminal of works, which mostly less than 5 years old.

7.3.2 Contributions to management practice

Extant literature points out that there has been neglect of public sector organisations research with reference to innovation. This gap that scholars have identified prior to the present study can now find some closure in the results of the present research, in that it can help public sector organisations to become more innovative in creating value to the general public. Public sector managers will find this study useful since it addresses employees, middle and top managers of the public organisations by sensitising them to adopt innovative approaches in their activities. The present study addresses areas such as, *strategic and transformational*

leadership, training and development, entrepreneurial activities, government/political support, top management support and employee empowerment as a way to transform public sector organisations to be innovative to create value for the general public. Extant literature has shown evidence that public sector organisations can innovate if the organisational leadership has the vision and can articulate the vision through the organisational ranks in clear terms (Spicker, 2012). Secondly, integration of the organisational strategy with innovation is what makes the public sector innovate. Thirdly, leadership plays an important role in the provisions of resources, which are critical for employees to experiment in order to generate innovative products/services, and allow employees to toy around with ideas that are a precursor to innovation. Leadership support is also crucial in creating an enabling organisational environment where flow and exchange of ideas among employees takes place and the climate is conducive to creativity and innovation.

Top management support is very critical in areas such as motivation and recognition of employees. Empirical evidence suggests that, in order for the employees to be creative and innovative, top management support should come in the form of the recognition and reward for innovative ideas to those employees whose ideas translate into tangible outcomes. Top management must encourage a culture of tolerance for constructive criticisms from employees, encourage divergent thinking, and exercise some degree of autonomy in decision-making. Innovation can only take place with the full support from top management through the clear understanding of innovation imperatives.

In addition to the aforementioned contributions, training and development of employees in areas such as problem-solving, creative thinking, and skills update has been found to be instrumental in increasing the organisation's chances of generating useful ideas which can translate into innovation. Training and development should be looked at from two perspectives; motivation of employees and an increase in skills level of employees that enhances their chances of tackling organisational problems with confidence. The literature review (Sanz-Valle, Naranjo-Valencia, Jiménez-Jiménez & Perez-Caballero, 2011) has shown that organisations that allow continuous learning among employees are likely to equip such employees with

problem-solving skills that can eventually enhance the organisation's opportunities to be creative and innovative.

7.3.3 Contributions to policy

Government/political support: Public sector organisations are a creation of legislation (laws), with special reference to fulfil specific mandates as prescribed by the very laws that created them. It is against this backdrop that the government/political support and interference in the management and affairs of the public sector organisations have become imperative. The mandate warrants PSOs to be accountable to the government of the day in many ways as well as to the general public whose interest the government serves. Government/political support comes in the form of government subvention that is seed money and appointment of the chief executive officers of these organisations. However, the reviewed literature tends to call for a divorce between the government/politics and public sector operations in order for them to be competitive. This call encourages the government to formulate a policy framework bearing in mind such a policy should foster innovation in public sector organisations as opposed to the one that will stifle it. Evidence (Agolla & Van Lill, 2013; Liu, 2011:253) suggests that policy innovation by governments in the developed world have positively transformed most public sector organisations. In those countries, public sector organisations have been found to be entrepreneurial and innovative. Therefore, public sector policy makers and legislatures should bear in mind that when such regulatory frameworks are being crafted, they must be tied to the level of innovation among the CEOs of these organisations, but at the same time make CEOs more accountable and responsive to the general public interest.

In this way, policy makers will be encouraging PSOs to be entrepreneurial and innovative to create public value. The appointment of CEOs for the PSOs must be merit based and open to competition in order to get the best brains rather than rely on political affiliations. Political interference only brings mediocrity in the running of the affairs of the PSOs, with huge implications to the taxpayers.

7.3.4 Contributions to methodologies

The present study has contributed to methodologies through the integration of the literature from public and private streams that enhance our knowledge and general understanding of a conceptual model of PSOs innovation. The theoretical framework based on previous studies - innovation drivers, innovation barriers, strategies to overcome barriers, and innovation outcomes/indicators - helped develop a complete model for public sector innovation. First, the present study has contributed substantially through adoption of mixed methods and triangulation approaches. Second, the study demonstrated the ability of mixed methods approaches and highlighted how future researchers could apply them without many problems. Third, the study highlighted the challenges in the reflective section in adopting mixed methods research and how to adapt these as part of evolving mixed methods research strategy. Fourth, the study also highlights methodological triangulation of data, specifically if empirical data and theory conflict, offering insight to new researchers interested in mixed methods research strategy in future. Fifth, the research also claims that, purposive sampling and extensive access to both types of data are *ex ante* requirements for these mixed methods research. Last, the methodological contributions can be seen as application of SEM and regression analyses of data. These are higher statistical softwares version with degree of statistical precisions, which command a lot of respect from scholars, and demonstrated how they can be combined for better results.

7.4 LIMITATIONS AND FUTURE RESEARCH

This study has registered a number of contributions to the discipline of innovation with special reference to public sector organisations in a third world country (Kenya). The present study still notes some limitations that it wishes to bring to the attention of the readers. These limitations and future avenues for research are summarised as follows:

- ❖ First, the present study expresses some degree of concern with regard to external and internal validity, relating to the generalisability of the findings and the presumed relationship. This generalisability refers to the data collected from three populations taken only from the Ministry of

Regional Development Authorities (MORDAs), KERIO-Valley Development Authority (KVDA) and Lake Basin Development Authority (LBDA) respectively, and not all Kenyan public sector organisations, therefore the application of the findings to other organisations that were not part of this study should be done with great care. However, in terms of the population, this is fairly representative of Kenya's public sector organisations.

- ❖ Second, future studies may explore the possibility of inclusion of a larger population that consists of more than one ministry and, perhaps, this could shed more light on the status of innovation in Kenya's public sector organisations. In addition, a consideration to replicate the study in different geographical settings also should be undertaken to corroborate the present study findings.
- ❖ Third, the present research was a survey-based inquiry; hence time (cross-sectional) has been identified as a constraint factor since the study was done within a specified time period. The study used only the survey method as strategy to collect data; therefore, it shares some of the limitations that are always associated with the survey strategy. Future research could explore the possibility of a longitudinal study to overcome this problem.
- ❖ Fourth, internal validity and analytical procedures were areas where limitations were noted. The present study and its measurement of the constructs may not be without some problems, particularly where the application of the SEM analysis was involved. Some measurements were employed after several adjustments. Some of the measures could not have captured the real intended constructs. This resulted in the combination of the constructs, as their loadings were not statistically significant, culminating in dropping some items in the measured constructs. The present study suggests further research to find out the relationship between internal drivers and external drivers to innovation outcomes/indicators since they could have been influenced by outlier factors not included in this analysis.
- ❖ Fifth, the present research conducted a focus group discussion (FGD) with middle managers. However, this could be a limitation as seen in the contradiction in the two responses. Therefore, the

results suggest that a FGD with employees would be ideal to get to the bottom of this contradiction of the quantitative and qualitative responses that were found in this study.

- ❖ Sixth, the present research developed a model based on theory and empirical data collected from three organisations. However, the current study suggests further studies that could cover more organisations to enable us understand the underlying factors responsible for driving innovation in the public sector organisations. Particular attention should be paid to constructs like *internal and external drivers* to innovation in the public sector and their relationship with *innovation outcomes/indicators*.
- ❖ Seventh, the study developed measuring instruments for assessing innovation in public sector organisation based on different research streams, which may need some validation in settings different from the three organisations or cultural aspect. This should help with validating this measuring instrument for future use in assessing innovation in the public sector.
- ❖ Last, in concluding, the present research results advanced research on innovation in the public sector, a concept that has received less attention from researchers, providing new insights and future avenues for further research particularly in the developing world. This study also contributes to the public sector by questioning some well-developed conventions. The present thesis has developed for the first time an empirically driven measurement instrument that can be applied when collecting data on innovation from the developing world, specifically Kenya's public sector organisations. It is hoped that the instrument developed can serve as a foundation for future researchers and practitioners interested in the study of innovation in the public sector organisations elsewhere, which was not part of the present study.

The following Chapter 8 deals with the reflections on the mixed methods and triangulation approaches as away to study innovation as a discipline within social sciences and offers insights on the usefulness of applying theoretical lens for future studies.

CHAPTER 8 REFLECTIONS

8.1 INTRODUCTION

The present study reflects on the ontology and epistemological foundations of mixed methods and triangulation approaches, and highlights the challenges and opportunities for adoption of mixed methods and triangulation approaches grounded on pragmatism philosophy.

The study sets out that; an integrated quantitative and qualitative analysis can be implemented to provide new insight into more facets of a data dealing with innovation practices. These approaches (mixed methods and triangulation approaches) presented opportunity to develop greater skills and provide richer position of the assessment of innovation in the public sector organisations. On personal choices, the present research could have been conducted using single research method, adopting either quantitative or qualitative research methods (De Silva, 2011:97). However, in order to develop critical research skills necessary to undertake future complex studies, the researcher opted for both quantitative and qualitative methods. The researcher took this path in order to develop stronger and critical skills set that were not obvious before the present research was undertaken (Raich, Müller & Abfalter, 2014: 740). The skills needed in order to carryout the present research were measurement scale design, data collection, data analysis and data integration. In addition to these, carrying out mixed methods research implied the researcher needed to be able to interpret the results regarding to not only prior research but also findings of other research methods. This was costly and time-consuming exercise on the part of the researcher, thus the easier option would have been to conduct research using a single method (De Silva, 2011:97; Raich, Müller & Abfalter, 2014: 740).

Considering a single method research, irrespective of the number of studies, would have resulted in easier data analysis, and interpretation and write up of the results, hence less time and resources consumption on the project (De Silva, 2011:97). This could have resulted in some benefits to the researcher in terms of the number of article papers publishable, however the researcher did not choose the method based on simplicity,

energy, the number of publications or any other superficial determination. Instead, the researcher was guided with the approach that would lead to a substantial contribution to knowledge, hence the adoption of the appropriate research approach with the ability to eliminate some of the weaknesses that has been found common in a single method research. It is against this backdrop that mixed methods research was deemed appropriate and useful in the assessment of innovation in the public sector organisations.

Other decisions for considerations were research designs choices since mixed methods research have already been opted for. The question that confronted the researcher was at what phase should mixing should be undertaken simultaneously or sequentially? The decision needed to take into account the potential biases that may be introduced into the focal study and the possible trade-off that needed to be made. Quantitative method of data analysis is well accepted as an appropriate research method in a survey design. A survey design provides a quantitative or numeric description of trends, attitudes, or opinions of a population by studying a sample of the population. From sample results, the researcher generalizes or makes claims about the population.

On choosing an appropriate qualitative approach, the researcher made a deliberate choice by opting for Focus Group Discussions (FGD). This allowed direct engagement with key stakeholders (informants) in the management of the public sector organisations surveyed. Though participation rates can be a problem that needs to be addressed. Like most of the qualitative approaches, the sample for FGD was affected by constant unavailability of the key persons (informants) or commitment such as attending ISO audit that was on going at the time of data collection. Hence, limited generalisability due to limited number of FGD conducted. Time constraints of the researcher proved a challenge since he had only two months to collect the data from the participants. These problems could be minimised using other qualitative methods. Researcher's presence in the face-to-face discussions with the key informants could have created some bias responses, however steps were taken to mitigate such bias is contained. Tape recorder was utilised in order to capture the proceedings from the FGD. Content analysis was subjected to objectivity through established coding procedures and instruments. In brief, the present research adopted QUAN $\leftrightarrow$ QUAL concurrent triangulation mixed

methods research design and steps were taken to minimise bias. This approach gave equal weightage to both quantitative and qualitative data collected by the researcher. These data were later used to confirm, disconfirm, cross-validation or corroborate the results (Cresswell, 2009:145).

Theory testing was performed using structural equation modelling (SEM) to establish the hypothesised relationships among the variables. Improvement standard methods used to test relationship in SEM, which is, modification (refinement) and respecification of models improvement, researcher learnt that, there was need to delete some paths to improve the model on the one hand, while on the other hand, one additional path was needed to improve the structural model. The researcher resorted to multiple runs of statistical analyses on quantitative data until confirming evidence if found. When hypothesised relationships were refuted, the researcher looked for robustness tests for a statistical explanation for the inconsistency (De Silva, 2011:97; Malina, Nørreklit & Selto, 2011:63). It was evidence that, the theory was right, so it must be lack of power, or sample size. In this case, the researcher had to go back to the qualitative data to investigate the reason behind this inconsistency. The qualitative data revealed that, the samples for FGD was made up of purely management, while the quantitative data was non managerial employees, hence the possible differences in understanding of innovation drivers, innovation barriers, strategies to overcome barriers, and innovation outcomes/indicators. This enables the researcher to gain an insight into the role-played by the samples from which information is sought. It was evident that, in order to eliminate such discrepancy between the responses from quantitative and qualitative data, it is important to administer the two tests to the same population of the study. The administration of questionnaires must take into account the level of education, position within the organisation and experience.

Quantitative studies can be used to test, refine theory. A theory refinement study begins with a specific theory and clear objective then advances the theory by replacing constructs with lower explanatory power with the new constructs or establishes stronger linkages between constructs (Cresswell, 2009:145; Malina, Nørreklit & Selto, 2011:63; Raich, Müller & Abfalter, 2014: 740). While, qualitative studies can be used to refute the theory when the field data do not match the established theory. However, the researcher learnt that,

quantitative methods could be useful in confirming theory in quasi-experiment studies like the study of innovation, where there is non-experiment control (Malina, Nørreklit & Selto, 2011:63).

Just in like in other quantitative methods research, quantitative research in innovation is meant to confirm causal link or establish the relationships among the variables in innovation information, innovation drivers, innovation barriers, strategies to overcome innovation barriers, and innovation indicators and organisation strategy. This could have resulted in failure in statistical power, hence lack of confirmation on the theory. It is noted that mixed or contradicting outcome is an indication that the underlying conceptual model or theory is insufficient in representing the phenomenon under investigation (Cresswell, 2009:214; Malina, Nørreklit & Selto, 2011:63). Since, this was evidence in the present study, it is recommended that, these signals of inadequacy should not be ignored or rationalised away *ex post* (Malina, Nørreklit & Selto, 2011:64). The researcher opted for the mixed methods research since it can concurrently answer confirmatory and exploratory questions and therefore verifies and generates theory in the same study (Tashakkori & Teddlie, 2003:15). Just like most empirical study, the present study moved from theory to data. However, the researcher learnt that, knowledge of a phenomenon advances by continually cycling between theory data (Malina, Nørreklit & Selto, 2011:64). Other scholar suggests that, when existing theories conflict with the patterns observed in the study, further analysis should be carried out to explain the conflicts (Malina, Nørreklit & Selto, 2011:64; Scapens, 1990). However, when lack of confirmation occurred in the present study as the theory came in contact with empirical reality, and because researcher collected quantitative and qualitative data, the researcher was able to shift from theory confirmation to theory refinement/refutation. This move enabled the present study to provide insight into the unusual quantitative findings and advance theory.

The study established that data obtained from the present research were able to corroborate or complement each other, hence validating the results of the study, a thing that proved the usefulness of mixed methods and triangulation approaches. The study also demonstrated that, in practice it is possible to concurrent apply different analysis methods or to collect different types of data to understand a phenomenon in a single study.

Therefore, the present study recommends for mixed methods and triangulations approaches and separate analyses that can later be compared with each datasets in support for each other. In addition, the researcher advocates for mixed methods approach employing pragmatist approaches that are well planned along with quantitative and qualitative methodologies incorporating concurrent triangulation strategy.

Using data from a case study of public sector organisations, the present research found the applicability of mixed methods and triangulation approaches to explore the nature of innovation as emerging discipline within social sciences. Reflecting on the present study, on the one hand, methodologically, it can be said that innovation may be studied in a way that allows individuals/researchers to share another's ideas or experiences and develop equivalent meanings that can help them better deal with emanating issues from the society and environment. On the other hand, at practical phase, the study found that a methodological motivated by pragmatism involve exploring how organisation members and other stakeholders generate ideas and share such ideas to solve society problems. For example, to capture employees ideas generation (ideation) or why some ideas are deliberately accepted or discarded in the organisations, are issues that can only be dealt with when there is engagement with them in the form that allowed researcher to probe. The FGD responses were not always accepted as given without further moderation, which led to the identification of conflicting results to the theoretical content of the present study.

While the present study has demonstrated the advantages of mixed methods and triangulations approaches, the study wish to point out some limitations as follow: First and foremost, analyses can be challenging since the researcher has to deal with more than one datasets, which proved complex as this demanded some software and knowledge of the same. Secondly, the usual problem associated with the results of two separate methods. It may not be easy to compare the results of two analyses using data of different forms. Lastly, the researcher was unclear on how to resolve discrepancies that arise in comparing the results emanating such different analyses (Cresswell, 2009:214; Malina, Nørreklit & Selto, 2011:63).

However, the present offers avenue for future researchers interested in conducting mixed methods and triangulation approaches by encouraging them to consider conducting additional data collection to resolving the discrepancies. Alternatively revisiting the original database, gaining new insight from the disparity of data, or developing a new project that addresses the discrepancies (Cresswell, 2009:214). The researchers considering the adoption of mixed methods research should bear in mind the cost involved both to the research and researcher vis-a-viz the improved contribution to knowledge achievable when adopting mixed methods research over alternative approaches. Thus, the opportunity provide by mixed methods research to obtain a fuller and richer picture of assessment of innovation in the public sector practices and processes outweighs the costs in terms of extra time and energy needed to collect, analyse, interpret, integrate and write up the data (Raich, Müller & Abfalter, 2014: 745).

Researcher concludes this section by claiming that, research is a learning process, more than a theory testing. For example, Malina, Nørreklit and Selto (2011:66) opine that, theories are never so complete or irrefutable that they should never emerge unscathed from any qualitative or (jointly) quantitative investigation. It is the researcher conviction that, every research project should educate the researchers as well the readers (De Silva, 2011:96; Malina, Nørreklit & Selto, 2011:63). The researcher further adds that, as researchers we must educate ourselves on multiple methods or collaborate with co-authors that have missing expertise, but who also appreciate the value of both qualitative and quantitative methods and data. Having done both, and now claim the knowledge, the researcher wish to state that, at least intellectually has been enriched by the experience. The present study also claims enrichment since it employed both qualitative and quantitative methods. Therefore, based on the researcher experience and knowledge, a complete picture cannot be painted by any one method alone (Raich, Müller & Abfalter, 2014:741).

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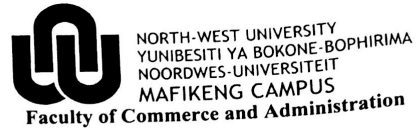
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APPENDIX 1: Covering letter to the organisations



DEPARTMENT OF MANAGEMENT

Tel: +27 18 3892565
Fax: +27 18 3892022
E-mail: Frazer.Kadama@nwu.ac.za
Internet: <http://www.nwu.ac.za/>

02/12/2011

TO WHOM IT MAY CONCERN

This is to confirm that the bearer is registered as a student at this university and his particulars are as follows:

Names	Mr. Joseph Evans Agolla
Student number	21229120
Course	PhD in Management
Topic	An assessment of innovation in Kenya's public sector organisations

Mr. Agolla will be collecting data in fulfilment of his course requirements. Any assistance rendered to him will be highly appreciated.

Yours truly,

PROGRAMME COORDINATOR

APPENDIX 2: Research clearance permit

CONDITIONS	
1. You must report to the District Commissioner and the District Education Officer of the area before embarking on your research. Failure to do that may lead to the cancellation of your permit	 REPUBLIC OF KENYA RESEARCH CLEARANCE PERMIT
2. Government Officers will not be interviewed without prior appointment.	
3. No questionnaire will be used unless it has been approved.	
4. Excavation, filming and collection of biological specimens are subject to further permission from the relevant Government Ministries.	
5. You are required to submit at least two(2)/four(4) bound copies of your final report for Kenyans and non-Kenyans respectively.	
6. The Government of Kenya reserves the right to modify the conditions of this permit including its cancellation without notice	

GPK6055t3mt10/2011 (CONDITIONS—see back page)

PAGE 2	PAGE 3
THIS IS TO CERTIFY THAT: Prof./Dr./Mr./Mrs./Miss/Institution Joseph Evans Agolla of (Address) North West University Private Bag x2046, South Africa has been permitted to conduct research in Location Selected Districts Selected Provinces on the topic: An assessment of innovations in the Kenya's Public Sector Organizations. for a period ending: 30th November, 2012.	Research Permit No. NCSI/RCD/14/012/611 Date of issue 5th June, 2012 Fee received KSh. 1,000  Applicant's Signature Secretary National Council for Science & Technology

APPENDIX 3: Informed consent letter to the participants

INFORMED CONSENT

AN ASSESSMENT OF INNOVATION IN KENYA'S PUBLIC SECTOR ORGANISATIONS

Joseph Evans Agolla - (Doctoral Candidate)
School of Management Sciences,
Faculty of Commerce and Business Administration,
North-West University,
Mafikeng Campus,
Private Bag x 2046, Mmabatho, 2735,
South Africa.

ATTN: ALL Lake Basin Development Authority; Kerio Valley Development Authority; and
Ministry of Regional Development Authority Staff

You are kindly being requested to participate in a *PhD project*. The purpose of this study is to *assess innovation in your organisation*. Before you decide to participate in this study, it is important that you understand why this study is being done. Please ask the researcher if there is anything that is not clear that you may need more information on.

The study is expected to take approximately 30 minutes of your committed time when you respond to the 5 pages questionnaire by ticking in the boxes.

The participation in this research is voluntary. You have the right to withdraw your participation in this study at any time with or without giving a reason. However, you are encouraged to participate fully. There are no costs to you for the participation in this research and there will be no compensation to you in participating in this research.

The risks in this study are very minimal. Your comments will be anonymous as the researcher undertakes to preserve your confidentiality including the following: Notes, interview transcriptions, and transcribed notes and any other identifying participant information will not be divulged to any third party without your consent.

We however hope that the information obtained from this study will help improve the performance of your organisation by increasing innovative capacity of your organisation, helping formulate appropriate innovative friendly policy and above all improve the competitiveness of your organisation.

By signing this consent form, I confirm that I have read and understood the information and have had the opportunity to ask questions. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving a reason and without cost. I understand that I will be given a copy of this consent form. I voluntarily agree to take part in this study.

Signature _____

Date _____

APPENDIX 4: Descriptive statistics for the pilot test

No	Items	Mean	SD
1	<i>Response to customers demands</i>	2.96	1.081
2	<i>Generation of revenue</i>	2.65	1.012
3	<i>Increase operational efficiency</i>	3.15	1.053
4	<i>Creation of employment opportunities</i>	3.02	1.031
5	<i>Application of new and appropriate technologies</i>	3.17	.995
6	<i>Development of new products</i>	3.38	1.078
7	<i>Strong teamwork/ collaboration with customers and suppliers</i>	3.26	1.112
8	<i>Tolerance for risk -taking in the organisation</i>	2.98	.971
9	<i>Use of feedback from the customers and suppliers</i>	2.96	1.176
10	<i>Availability of organisational resources</i>	2.98	1.029
11	<i>Strong research and development</i>	2.61	1.204
12	<i>Collaboration with other research institutions /private bodies</i>	2.91	1.186
13	<i>Communication of formalized organisation strategy</i>	3.06	1.106
14	<i>Rewarding of creative /innovative people</i>	2.67	1.184
15	<i>Selection of creative /innovative people</i>	2.81	1.183
16	<i>Strategic leadership</i>	3.19	1.117
17	<i>Encouraging of employees to solve problems</i>	3.13	1.229
18	<i>Support for employees with new ideas</i>	2.87	1.150
19	<i>Organisation openness to constructive criticisms</i>	2.70	1.283
20	<i>Organisation involvement of employees in decisions making</i>	2.81	1.375
21	<i>Putting ideas into action in the organisation</i>	3.00	1.133
22	<i>Political stability in the country</i>	3.89	4.201
23	<i>Accountability to the government forces</i>	3.37	1.015
24	<i>Keeping up with the public needs and expectations</i>	3.25	.897
25	<i>Pursuance of political goals/ agenda</i>	2.60	1.069

26	<i>Pressures to contain costs</i>	3.00	.863
27	<i>Countering factors perceived to be threats</i>	3.20	1.010
28	<i>Generating more revenues</i>	2.40	1.034
29	<i>Solving society problems</i>	3.02	1.163
30	<i>Creating employment opportunities for the population</i>	2.98	1.213
31	<i>Improving service to the society</i>	3.37	1.010
32	<i>Protecting environment</i>	2.88	1.089
33	<i>Reducing effects of climate change on the environment</i>	2.81	1.103
34	<i>Application of new technologies</i>	2.96	1.095
35	<i>New legislation</i>	3.00	.886
36	<i>Regulations</i>	3.12	.832
37	<i>Industrial policies</i>	2.86	.700
38	<i>Government policy on education towards innovative – economy</i>	3.21	.997
39	<i>Government support through funding</i>	3.63	.768
40	<i>Establishment of national innovation systems</i>	3.08	.821
41	<i>Formulation of appropriate business policies</i>	3.15	.875
42	<i>Public procurement by the government</i>	3.22	.975
43	<i>Collaboration with private sector</i>	2.94	1.018
44	<i>Collaborations with research organisations</i>	2.86	1.000
45	<i>Collaborations with public universities</i>	3.10	.913
46	<i>Collaborations among members within the organisation</i>	3.04	1.047
47	<i>Collaboration among team members on projects</i>	3.21	1.016
48	<i>Inadequate resources</i>	3.71	1.270
49	<i>Over - exploitation of the established resources</i>	3.25	.979
50	<i>Short - term budgets and planning horizons for innovation</i>	3.45	.972
51	<i>Inadequate support mechanisms form top management</i>	3.34	1.159
52	<i>Absence of National Innovation Systems in the country</i>	3.44	1.162
53	<i>Inadequate support from the government</i>	3.15	1.167
54	<i>Too much regulative /legislative constraints in the organisation</i>	3.17	1.014
55	<i>Frequent political interferences in the organisation</i>	2.94	1.167
56	<i>Political appointment for the top positions in the organisation</i>	2.92	1.307

57	<i>Weak linkages with private institutions / universities</i>	3.37	1.172
58	<i>Inadequate research and Development in the organisation</i>	3.70	.868
59	<i>Pressures to deliver on time within administrative deadlines</i>	3.51	1.171
60	<i>Poor coordination within the organisation</i>	3.74	.944
61	<i>Risk taking discouraged due to its consequences in the organisation</i>	3.31	1.103
62	<i>Criticisms of ones ideas whether constructive are highly discouraged</i>	3.19	1.161
63	<i>Resistance to change and new ideas</i>	3.55	.952
64	<i>Inadequate reward for risk taking and creative ideas</i>	3.53	.992
65	<i>Bureaucratic culture</i>	3.42	1.263
66	<i>Lack of clear communication on organisation innovation</i>	3.57	1.010
67	<i>Lack clear overall formalised strategy on innovation</i>	3.55	1.045
68	<i>Lack of strategic leadership</i>	5.30	9.997
69	<i>Lack of measurement and reporting systems of innovation</i>	3.57	.964
70	<i>Inadequate resources</i>	3.94	.835
71	<i>Encouraging open communication</i>	4.32	.754
72	<i>Democratic Leadership</i>	4.13	.785
73	<i>Encouraging employees to think outside the box</i>	4.09	1.024
74	<i>Encouraging continuous learning and training</i>	4.09	1.061
75	<i>Top management commitment to innovation</i>	3.94	1.085
76	<i>Availability of materials</i>	3.87	.962
77	<i>Encouraging ideas sharing among the organisation employees</i>	4.04	.940
78	<i>Encouraging open and free ideas among the employees</i>	4.04	.898
79	<i>Providing adequate funds tot e organisation to source other needed resources</i>	4.28	.662
80	<i>Strong government support</i>	3.92	.958
81	<i>Investing more on Research and Development</i>	4.12	.900
82	<i>Encouraging collaboration between the organisation and universities</i>	4.13	1.001
83	<i>Fostering partnership between the organisation and Universities</i>	4.13	.810
84	<i>Adequate reward for innovation</i>	3.98	.787
85	<i>Celebrating innovation</i>	3.92	.851

86	<i>Developing clear measurement of innovation</i>	3.89	.800
87	<i>Eliminate bureaucratic structure that impedes communication</i>	3.89	1.086
88	<i>Allowing employees some degree of autonomy</i>	3.57	.821
89	<i>Delegating challenging tasks that demand creative problems solving</i>	3.51	1.085
90	<i>Formalized organisation strategy for innovation</i>	3.92	.882
91	<i>Eliminating procedures and policies that stifle innovation</i>	4.04	.784
92	<i>Selection of creative and innovative employees</i>	3.60	.906
93	<i>Rewarding innovative employees</i>	3.81	.886
94	<i>Formulation of innovation friendly policies</i>	3.87	.941
95	<i>Eliminating political patronage to allow employees to work freely and openly</i>	3.96	.919
96	<i>Appointment of merit rather than political affiliation</i>	3.87	1.241
97	<i>Tolerance for Mistakes to allow employees to take risk</i>	3.51	1.171
98	<i>Establishing National Innovation Systems in the country to guide innovation activities</i>	3.92	1.053
100	<i>Customer satisfaction</i>	4.51	.669
101	<i>Increase in the new products / services provided</i>	4.15	.864
102	<i>Increase in revenue due to ideas generated by employees</i>	3.79	.848
103	<i>Percentage of amount spent on the research and development</i>	5.21	7.814
104	<i>Number of registered Intellectual Property</i>	3.92	1.017

APPENDIX 5: Regression tables

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.362 ^a	.131	.095	.71942	.131	3.634	7	169	.001	2.342

a. Predictors: (Constant), INT Collaboration, INT Entrepreneurship, INT Org_Strat, INT Org_Resources, INT Economic, INT Lead_Prac, INT Org_Cult

b. Dependent Variable: INOV Innovation

ANOVA^b

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	13.164	7	1.881	3.634	.001 ^a
Residual	87.470	169	.518		
Total	100.634	176			

a. Predictors: (Constant), INT Collaboration, INT Entrepreneurship, INT Org_Strat, INT Org_Resources, INT Economic, INT Lead_Prac, INT Org_Cult

b. Dependent Variable: INOV Innovation

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
1 (Constant)	2.646	.421		6.288	.000		
INT Org_Strat	-.027	.105	-.035	-.261	.795	.284	3.517
INT Org_Cult	.056	.100	.079	.562	.575	.261	3.837
INT Org_Resources	.061	.085	.067	.713	.477	.589	1.698
INT Lead_Prac	.253	.108	.274	2.331	.021	.371	2.692
INT Entrepreneurship	.032	.112	.035	.289	.773	.354	2.827
INT Economic	-.039	.100	-.037	-.389	.698	.565	1.771
INT Collaboration	.068	.077	.068	.875	.383	.860	1.163

a. Dependent Variable: INOV Innovation

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.304 ^a	.093	.066	.73077	.093	3.489	5	171	.005	2.445

a. Predictors: (Constant), EXT Technology, EXT Gov_pol_EXT, EXT Customers, EXT Suppliers, EXT Social

b. Dependent Variable: INOV Innovation

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	9.315	5	1.863	3.489	.005 ^a
Residual	91.319	171	.534		
Total	100.634	176			

a. Predictors: (Constant), EXT Technology, EXT Gov_pol_EXT, EXT Customers, EXT Suppliers, EXT Social

b. Dependent Variable: INOV Innovation

Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
1 (Constant)	3.005	.453		6.632	.000		
EXT Customers	.175	.077	.192	2.279	.024	.745	1.343
EXT Suppliers	.031	.086	.030	.355	.723	.723	1.382
EXT Gov_pol_EXT	.059	.069	.069	.851	.396	.803	1.246
EXT Social	-.182	.089	-.190	-2.039	.043	.612	1.633
EXT Technology	.204	.091	.209	2.243	.026	.611	1.637

a. Dependent Variable: INOV Innovation

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.450 ^a	.202	.184	.68314	.202	10.910	4	172	.000	2.500

a. Predictors: (Constant), TMLead, BAR Over_Reliance, GF73to74, TMSupp

b. Dependent Variable: INOV Innovation

ANOVA^b

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	20.365	4	5.091	10.910	.000 ^a
	Residual	80.269	172	.467		
	Total	100.634	176			

a. Predictors: (Constant), TMLead, BAR Over_Reliance, GF73to74, TMSupp

b. Dependent Variable: INOV Innovation

Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
1 (Constant)	2.346	.279		8.410	.000		
BAR Over_Reliance	.166	.055	.218	3.004	.003	.883	1.133
GF73to74	.023	.056	.031	.404	.687	.788	1.270
TMSupp	-.039	.060	-.058	-.652	.515	.594	1.683
TMLead	.303	.072	.370	4.203	.000	.599	1.671

a. Dependent Variable: INOV Innovation

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.795 ^a	.632	.626	.46237	.632	99.238	3	173	.000	2.299

a. Predictors: (Constant), OB_Org_Leadership_new, OB_govt_pol_new, OB_Top_Management_new

b. Dependent Variable: INOV Innovation

ANOVA^b

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	63.648	3	21.216	99.238	.000 ^a
	Residual	36.986	173	.214		
	Total	100.634	176			

a. Predictors: (Constant), OB_Org_Leadership_new, OB_govt_pol_new, OB_Top_Management_new

b. Dependent Variable: INOV Innovation

Coefficients^a

Model	Unstd Coefficients		Std Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
1 (Constant)	1.107	.199		5.556	.000		
OB_govt_pol_new	.022	.073	.022	.303	.762	.394	2.541
OB_Top_Management_new	-.001	.064	-.001	-.019	.985	.374	2.673
OB_Org_Leadership_new	.727	.070	.780	10.453	.000	.381	2.622

a. Dependent Variable: INOV Innovation

APPENDIX 6: Descriptive statistics of the final survey

Variables	Minimum	Maximum	Mean	Standard Deviation
Organisation strategy				
q1	1	5	3.68	1.134
q2	1	5	3.57	1.143
q3	1	5	3.61	1.093
q4	1	5	3.45	1.234
Organisation culture				
q5	1	5	3.33	1.308
q6	1	5	3.28	1.292
q7	1	5	3.30	1.249
q8	1	5	3.38	1.192
q9	1	5	3.47	1.283
Customers				
q10	1	5	3.48	1.205
q11	1	5	3.42	1.218
q12	1	5	3.53	1.154
q13	1	5	3.70	1.083
q14	1	5	3.83	.925
Suppliers				
q15	1	5	3.74	.990
q16	1	5	3.68	1.023
q17	1	5	3.81	.973
q18	1	5	3.92	.969
q19	1	5	3.89	.966
Organisation resources				
q20	1	5	3.88	.951
q21	1	5	3.86	1.028
q22	1	5	3.65	1.186
q23	1	5	3.56	1.233
q24	1	5	3.45	1.199
Leadership				
q25	1	5	3.55	1.037
q26	1	5	3.54	1.068
q27	1	5	3.54	1.093
q28	1	5	3.42	1.175
q29	1	5	3.29	1.152

q30	1	5	3.25	1.101
q31	1	5	3.28	1.133
q32	1	5	3.36	1.076
q33	1	5	3.41	1.048
q34	1	5	3.58	1.066
Entrepreneurship				
q35	1	5	3.69	1.098
q36	1	5	3.73	1.025
q37	1	5	3.84	.987
q38	1	5	3.80	.974
q39	1	5	3.74	1.027
Government/Political factors				
q40	1	5	3.66	1.046
q41	1	5	3.69	1.145
q42	1	5	3.84	1.107
q43	1	5	3.71	1.141
q44	1	5	3.71	1.096
q45	1	5	3.73	1.044
q46	1	5	3.80	1.027
Economic factors				
q47	1	5	3.87	.905
q48	1	5	3.86	.910
q49	1	5	3.70	.953
q50	1	5	3.62	1.086
q51	1	5	3.72	1.098
Social factors				
q52	1	5	3.83	1.069
q53	1	5	3.86	1.107
q54	1	5	3.99	1.024
q55	1	5	3.88	1.117
q56	1	5	4.05	.953
Technological factors				
q57	1	5	3.97	.932
q58	1	5	3.94	.943
q59	1	5	3.91	.979
q60	1	5	3.95	.982
Collaboration				
q61	1	5	3.99	.907
q62	1	5	3.87	.943

q63	1	5	3.78	1.048
q64	1	5	3.70	1.170
q65	1	5	3.69	1.189
Barriers to innovation				
q66	1	5	3.74	1.149
q67	1	5	3.64	1.138
q68	1	5	3.62	1.212
q69	1	5	3.56	1.370
q70	1	5	3.51	1.324
q71	1	5	3.69	1.232
q72	1	5	3.85	1.214
q73	1	5	3.86	1.173
q74	1	5	3.80	1.180
q75	1	5	3.70	1.173
q76	1	5	3.51	1.208
q77	1	5	3.54	1.162
q78	1	5	3.54	1.272
q79	1	5	3.70	1.251
q80	1	5	3.63	1.272
q81	1	5	3.66	1.262
q82	1	5	3.77	1.223
q83	1	5	3.85	1.211
q84	1	5	3.89	1.126
q85	1	5	3.81	1.149
q86	1	5	3.85	1.135
q87	1	5	3.85	1.111
q88	1	5	3.96	1.162
q89	1	5	3.98	1.139
Overcoming barriers to innovation				
q90	1	5	4.21	1.022
q91	1	5	4.26	.976
q92	1	5	4.25	.977
q93	1	5	4.14	1.043
q94	1	5	4.03	1.010
q95	1	5	3.95	1.087
q96	1	5	3.91	1.089
q97	1	5	3.77	1.118
q98	1	5	3.94	1.056

q99	1	5	4.06	1.062
q100	1	5	4.04	1.141
q101	1	5	4.00	1.175
q102	1	5	3.82	1.116
q103	1	5	3.92	.992
q104	1	5	3.89	.985
q105	1	5	3.89	1.090
q106	1	5	4.04	.969
q107	1	5	4.12	.976
q108	1	5	3.94	1.107
q109	1	5	3.93	1.172
q110	1	5	4.07	1.086
Innovation indicators				
q111	1	5	4.18	.966
q112	1	5	4.22	.911
q113	1	5	4.06	.941
q114	1	5	3.96	1.093
q115	1	5	3.94	.987
Number = 186				

APPENDIX 7: Innovation survey

Dear Respondent,

I am currently doing a research project leading to a **PhD (Business Management)** at the North-West University, South Africa. The topic of my research is **“AN ASSESSMENT OF INNOVATION IN KENYA’S PUBLIC SECTOR ORGANISATIONS:”** I am requesting you to fill in this questionnaire which is intended to assess the extent of innovation in your organisation. Your honest responses are essential in achieving this task. Participation in this survey is voluntary and confidentiality is assured. No individual data will be reported.

Thank you in advance for your cooperation.

Yours sincerely

JOSEPH E. AGOLLA

1. The statements **numbers 1 to 65 are drivers of innovation** in organisations. Indicate the degree of agreement or disagreement as they apply to your organisation using the following scale: (1). **Strongly Disagree (SD)**; (2). **Disagree (D)**; (3). **Slightly Agree (SLA)**; (4). **Agree (A)**; (5). **Strongly Agree (SA)**.

Please **TICK (✓)** in the appropriate boxes below. (Number 1-65)

No	Section A (Organisation Strategy)	SD	D	SLA	A	SA
1	The communication of clear vision to all employees	1	2	3	4	5
2	Clear communication of organisation's strategy to all employees	1	2	3	4	5
3	The sharing of organisation's vision by all the employees	1	2	3	4	5
4	The integration of innovation with the organisation strategy	1	2	3	4	5
	Section B (Organisation Culture)					
5	The shared organisation's values by all the members	1	2	3	4	5
6	The shared organisation's beliefs by all the members	1	2	3	4	5
7	Respect and trust for individual employees	1	2	3	4	5
8	The shared organisation's communication by all the employees	1	2	3	4	5
9	The celebration of creative ideas by the organisation's members	1	2	3	4	5
	Section C (customers)					
10	The organisation's response to customers' demands	1	2	3	4	5
11	The organisation's use of customers' feedback	1	2	3	4	5
12	Strong relationship between the organisation and its customers	1	2	3	4	5
13	The organisation's response to diverse needs of the customers	1	2	3	4	5
14	The organisation's needs to retain customers	1	2	3	4	5
	Section D (Suppliers)					
15	The strong relationship between the organisation and its suppliers	1	2	3	4	5

16	<i>The smooth flow of supplies to the organisation</i>	1	2	3	4	5
17	<i>The fair prices of raw materials by the suppliers</i>	1	2	3	4	5
18	<i>The quality of raw materials by the suppliers</i>	1	2	3	4	5
19	<i>The availability of local suppliers</i>	1	2	3	4	5

	Section D (Organisation Resources)	SD	D	SLA	A	SA
20	<i>The availability of material resources in the organisation</i>	1	2	3	4	5
21	<i>The availability of skilled workforce in the organisation</i>	1	2	3	4	5
22	<i>The availability of organisation's finances to source resources</i>	1	2	3	4	5
23	<i>The availability of training facilities in the organisation</i>	1	2	3	4	5
24	<i>The availability of rewards for creative employees in the organisation</i>	1	2	3	4	5

	Section E (Leadership)	SD	D	SLA	A	SA
25	<i>The strategic leadership within the organisation</i>	1	2	3	4	5
26	<i>The organisation's support for creativity</i>	1	2	3	4	5
27	<i>The organisation's leadership encourages employees to come up new ideas</i>	1	2	3	4	5
28	<i>The organisation's encouragement of problem solving</i>	1	2	3	4	5
29	<i>The organisation's openness to constructive criticisms</i>	1	2	3	4	5
30	<i>The involvement of employees' in the organisation's decision making</i>	1	2	3	4	5
31	<i>The organisation's reward for innovative ideas</i>	1	2	3	4	5
32	<i>The organisation's tolerance to risk taking by employees</i>	1	2	3	4	5
33	<i>The organisation's openness to change</i>	1	2	3	4	5
34	<i>Putting of the employees' ideas into action by the organisation</i>	1	2	3	4	5

	Section F (Entrepreneurship)	SD	D	SLA	A	SA
35	<i>The organisation's encouragement for search for new ideas</i>	1	2	3	4	5
36	<i>The organisation's emphasis on effective management of risk</i>	1	2	3	4	5
37	<i>The development of new concepts in the organisation</i>	1	2	3	4	5
38	<i>The organisation's continuous and willingness to learn new things</i>	1	2	3	4	5
39	<i>The organisation's provision of clear sense of direction</i>	1	2	3	4	5

	Section G (Government/ Political Factors)	SD	D	SLA	A	SA
40	<i>The stability of the political environment in the country</i>	1	2	3	4	5
41	<i>Government's friendly policies on trade and taxation</i>	1	2	3	4	5
42	<i>Government's friendly regulations on trade</i>	1	2	3	4	5
43	<i>Government's friendly industrial policies</i>	1	2	3	4	5
44	<i>The organisation's accountability to government</i>	1	2	3	4	5
45	<i>The government's support through funds</i>	1	2	3	4	5
46	<i>The public procurement by the government</i>	1	2	3	4	5

	Section H (Economic Factors)	SD	D	SLA	A	SA
47	<i>The organisation's needs to generate revenue</i>	1	2	3	4	5
48	<i>The organisation's needs to contain cost pressure</i>	1	2	3	4	5
49	<i>The organisation's needs to increase operational efficiency</i>	1	2	3	4	5
50	<i>The organisation's response to competition</i>	1	2	3	4	5
51	<i>The organisation's needs to develop new products or services</i>	1	2	3	4	5

	Section I (Social Factors)	SD	D	SLA	A	SA
52	<i>The organisation's needs to create employment opportunities</i>	1	2	3	4	5
53	<i>The organisations response to the society problems</i>	1	2	3	4	5
54	<i>The organisation's needs to improve services to the society</i>	1	2	3	4	5
55	<i>The organisation's needs to counter factors such as hunger and poverty</i>	1	2	3	4	5
56	<i>The organisation's needs to improve the standard of living of the society</i>	1	2	3	4	5

	Section J (Technological Factors)	SD	D	SLA	A	SA
57	<i>The organisation's applications of new technology</i>	1	2	3	4	5
58	<i>The availability of appropriate technology</i>	1	2	3	4	5
59	<i>The organisation's increase of operational efficiency</i>	1	2	3	4	5
60	<i>The organisation's access of internet and usage</i>	1	2	3	4	5

	Section K (Collaboration)	SD	D	SLA	A	SA
61	<i>The organisation's collaboration with the private sector</i>	1	2	3	4	5
62	<i>The organisation's collaboration with the research organisations</i>	1	2	3	4	5

63	The organisation's collaboration with the public universities	1	2	3	4	5
64	The team collaboration on organisation's projects	1	2	3	4	5
65	Collaboration among different organisation's departments to diffuse ideas	1	2	3	4	5

2. Statements numbers 66 to 89 are barriers to innovation in organisations. Rate them as they apply to your organisation using the following scale: **(1). Definitely not a barrier; (2). Usually not a barrier; (3). Uncertain ; (4). Usually a barrier ; (5).**

Definitely a barrier

Please **TICK (✓)** in the appropriate boxes below. **(Number 66 -8 9)**

Section K (Barriers to Innovation)

66	Inadequate resources (Materials, finance, skills, training facilities etc.)	1	2	3	4	5
67	Over- exploitation of the established resources (technologies, methods of operations etc.)	1	2	3	4	5
68	Short-term budgets and planning horizons for innovation	1	2	3	4	5
69	Inadequate support mechanisms from the organisation's top management	1	2	3	4	5
70	Absence of National Innovation System in the country	1	2	3	4	5
71	Inadequate resources support from the government	1	2	3	4	5
72	Too much regulative / legislative constraints in the organisation	1	2	3	4	5
73	Frequent political interference / interventions in the organisation	1	2	3	4	5
74	Political appointment for top positions in the organisation	1	2	3	4	5
75	Weak linkages / No linkages with private institutions / universities	1	2	3	4	5
76	Inadequate Research and Development in the organisation	1	2	3	4	5
77	Inadequate external collaboration within the organisation	1	2	3	4	5
78	Pressures to deliver on time within administrative deadlines	1	2	3	4	5
79	Poor coordination within the organisation	1	2	3	4	5
80	Risk taking by employees is discouraged due to its consequences in the organisation	1	2	3	4	5
81	Ideas whether constructive are never welcome in the organisation	1	2	3	4	5
82	Resistance to change and new ideas in the organisation	1	2	3	4	5
83	Inadequate reward for risk taking and creative ideas	1	2	3	4	5
84	Bureaucratic culture in the organisation	1	2	3	4	5
85	Lack of clear organisation communication on innovation	1	2	3	4	5
86	Lack of clear "overall formalised organisation's strategy on innovation"	1	2	3	4	5
87	Lack of strategic leadership in the organisation	1	2	3	4	5
88	Lack of measurement and reporting system of innovation	1	2	3	4	5
89	Absence of training and learning opportunities in the organisation	1	2	3	4	5

2. Statements numbers 90 to 110 are usually important factors in overcoming barriers to innovation in organisations. Rate them as they apply to your organisation using the following scale. (1). **Not Important**; (2). **Slightly Important**; (3). **Important**; (4). **Mostly Important**; (5).

Extremely Important

Please **TICK (✓)** in the appropriate boxes below. (Number 90 -110)

Section L (Overcoming Barriers)

90	The strong support from the government to the organisation	1	2	3	4	5
91	The government appropriate policies on taxation and trade	1	2	3	4	5
92	The government provision of finance to the organisation	1	2	3	4	5
93	The elimination of political patronage in the appointments	1	2	3	4	5
94	The government tax rebate for innovative organisation	1	2	3	4	5
95	The government formulation of innovation friendly policies	1	2	3	4	5
96	The organisation's encouragement of open communication	1	2	3	4	5
97	The organisation's tolerance for employees mistakes	1	2	3	4	5
98	The organisation's tolerance for employees' risk taking	1	2	3	4	5
99	The organisation's encouragement of ideas sharing	1	2	3	4	5
100	The organisation's rewards for innovative ideas	1	2	3	4	5
101	The commitment of top management to organisation's innovation	1	2	3	4	5
102	Allowing employees autonomy in deciding how to perform their tasks	1	2	3	4	5
103	The organisation's encouragement of continuous learning	1	2	3	4	5
104	Fostering partnership with the private sector	1	2	3	4	5
105	Collaborating with the public universities	1	2	3	4	5
106	Democratic leadership that allows employees to be critical thinkers	1	2	3	4	5
107	Appointment on merit rather than political affiliation	1	2	3	4	5
108	Integration of innovation with the organisation strategy	1	2	3	4	5
109	Celebration of innovation in the organisation	1	2	3	4	5
110	Selection of creative employees in the organisation	1	2	3	4	5

4. Statements **numbers 111 to 115** are important factors in measuring *Innovation* in organisation. Rate them as they apply to your organisation using the following scale. (1). **Not Important**; (2). **Slightly Important**; (3). **Important**; (4). **Mostly Important**; (5). **Extremely Important**

Please **TICK (✓)** in the appropriate boxes below. (**Number 111 - 115**)

Section M (Innovation Indicators)

111	Customer satisfaction	1	2	3	4	5
112	Increase in new products and services produced	1	2	3	4	5
113	Increase in revenues due to ideas generated by employees	1	2	3	4	5
114	Percentage of amount spent on the Research and Development in the organisation	1	2	3	4	5
115	Number of registered Intellectual Property by the organisation	1	2	3	4	5

116. Demography

[i]. Gender: Male _____ Female _____; [ii]. Age: _____ Years

[iii]. Highest Education:

[a]. Diploma

☐

[b]. Bachelor Degree

☐

[c]. Master

☐

[d]. PhD

☐

[iv]. Number of years working in this organisation: _____ years.

[v] Position:

[a]. Senior Management

☐

[b] Middle Management

☐

[c] Lower Management

☐

[d] Non- Management

☐

vi]. The public sector organisation I belong to is in the field of _____

END OF THE QUESTIONNAIRE!

APPENDIX 7: Focus group discussions questionnaire schedule

	Interviews Questions	Type of Information sought
1.	What do you understand by innovation as applicable to your organisation?	Definition, concepts of innovation
2	What makes your organisation to innovate?	Innovation drivers, friendly policy, networking, customers,
3	What would you say about your organisation innovation status currently?	Not innovative, slightly innovative, innovative, highly innovative.
4	What are the main challenges facing your organisation to innovate?	Innovation barriers (factors considered to be barriers to innovation)
5	What would you suggest to overcome the challenges facing your organisation innovation	Strategies to overcome barriers to innovation
6	How would you know if your organisation is innovative	Innovation outcomes; indicators; measures
7	We have talked about many things concerning innovation in your organisation. What else could you say about innovation in your organisation?	Promoting innovation, removing current bottlenecks.
8	What suggestions would you give to your organisation / Ministry	Improvement, performance

APPENDIX 8: Categorisation of FGD and comments

No	Category	Participants responses
1	Innovation	-New ideas, being creative -<i>'Innovation means doing things differently, or new things, and being creative when doing work,'</i> Says one employee -Improvement upon existing processes.
2	Innovation drivers	-Policy, -Networking, -Collaboration, -Partnerships with universities -Effective funding -<i>'You have to innovate to remain relevant in the market.'</i> Remarkd one respondent -<i>'We innovate in order to satisfy our customers, such as to meet their expectations,'</i> Stated another respondent
3	Barriers	-<i>'Look at the policy and see how it is rigid',</i> says one respondent -Budget constraining, -One can't express himself / herself freely, -No incentives to innovators, -Innovator has no patent rights on his / her own innovative product -Political influence - Rewards inadequate -<i>'How can someone innovate and the same person's ideas never get recognised?'</i> posed one respondent.
4	Overcoming barriers	-Networking, -Collaboration, -Partnerships, -<i>'Creation of a department to coordinate innovation activities,</i> says one respondent - Change policy, -Incentives for innovators, -Mentor innovators, - Promote employees with good ideas.
5	Innovation indicators / outcomes	-Number of patents registered, -Improvement in service delivery, -Customers satisfaction -<i>'Improvement on overall performance,'</i> says one respondent -Intellectual property rights -<i>'Customers' satisfaction,' 'patent rights and intellectual property rights,'</i> says another participant
6	Status of innovation	- <i>'Not much documented about innovation activities in the organisation,'</i> says another respondent. - IT not working properly -<i>'Projects not completed due to lack of fund,</i> says another participants